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ABSTRACT

The followup study of 1974 graduates of two Pennsylvania high school districts (Hazleton and Williamsport) is phase 4 of the vocational development study, a 10-year longitudinal study begun in 1968. Phase 4 evaluates the effectiveness of the school programs in preparing students for the world of work or for postsecondary education and examines the vocational development process. Socioeconomic background information is provided for Hazelton and Williamsport and further describes the population sample who were first studied as freshmen. Mailing of followup questionnaires was begun in March 1975, with all sampling (including a telephone followup) completed by June 30, 1975. The collection strategy is diagrammed and response data, analysis, and discussion of responses are given. Explanation of the data coding, storage, and tape layout systems are provided. With data from the overall longitudinal study other research has been undertaken. Appended are five convention papers that reflect this research: (1) "Path Analysis and Vocational Education Research: An Overview"; (2) "Patterns Related to Employment Satisfaction: A Casual Model Analysis"; (3) "Path Analysis and Vocational Development Research"; (4) "Path Analysis: An Investigation of Stability of Expressed Occupational Choice"; and (5) "Ovis Two-Year Stability: Grade 9-Grade 11--(Pennsylvania Sample)." Ohio Vocational Interest Survey, Special Report Series, Report No. 4, November 1974. (KH)

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THE
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EDUCATION

FINAL REPORT

AN EXAMINATION OF THE RELATIONSHIPS BETWEEN THE HIGH SCHOOL EXPERIENCES OF YOUTH AND SUCCESS AND SATISFACTION IN POST-SECONDARY ENDEAVORS

July 1, 1974 to June 30, 1975 (Project Number 19-4007)

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The Pennsylvania State University
University Park, Pennsylvania

July, 1975

VOCATIONAL – TECHNICAL EDUCATION **Research Report**

Pennsylvania Department of Education
Bureau of Vocational, Technical and Continuing Education
Research Coordinating Unit

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Pennsylvania Department of Education
Bureau of Vocational Education
Research Coordinating Unit

PREFACE

Throughout the history of the VDS Project, a major concern has been the relationship between various high school experiences, and the characteristics of the settings in which they occur, and subsequent student outcomes. When a longitudinal study is begun with ninth grade students, the answers to questions dealing with school effects upon post-secondary school criteria seem distant and abstract. But over time, a sample maturity is obtained which allows patient investigators to begin comparing early descriptive data about sample students to the diversity of options they pursue in their educational and occupational life as well as the satisfaction and success they find in such pursuits.

The current study represents the emergence of a level of sample maturity which permits a search for predictors of career success and the identification of factors in the secondary school experience which impede or facilitate such success. Enderlein previously examined causal relationships of student characteristics to satisfaction in post high school employment in VDS monograph 20, July 1974. His was the first attempt in the VDS project to look at relationships between student characteristics while in high school to subsequent outcomes. This study shifts the emphasis of concern from personal characteristics to curricula and other dimensions of schooling as the prime concerns. Of particular importance here is the examination of the sample students' perception of the counseling they received in high school.

The project staff believes that the VDS project has the potential to address questions about educational effects upon students which are implicit in the effective development of Career Education Activities, the improvement of vocational education, and the creation of informed responses to critics of education at large. The current study is but one step in that direction.

Edwin L. Herr
Professor of Education and Head
Department of Counselor Education
VDS Project Director

ACKNOWLEDGMENTS

This final report is part of a continuing research endeavor, the Vocational Development Study, conducted jointly by the Departments of Vocational Education and Counselor Education at The Pennsylvania State University with the support of the Pennsylvania Department of Education, Bureau of Vocational Education, Research Coordinating Unit (RCU). This report focuses upon the 1974 graduates of the Hazleton and Williamsport School Districts.

The cooperation of many people has contributed to the success of this project. First, among those who were instrumental in supporting the project are the administrative personnel from the two school districts involved. These include: from the Hazleton School District, Superintendent Mr. Daniel Parrell; Coordinator of Guidance Services, Mr. James Pape and his staff; Mr. Paul Wensko, Director, Area Vocational-Technical School, and Sister Mary Thomas at the Bishop Hafey High School. Personnel from the Williamsport School include: Superintendent, Dr. Oscar Knade; and Supervisor of Counseling, Mr. Glenn Lunger and his staff.

Secondly, financial and advisory support necessary for this project has beer provided by the Pennsylvania Department of Education, Bureau of Vocational Education, Research Coordinating Unit, directed by Dr. Carroll Curtis.

Finally, the staffs of the project and the Departments of Vocational Education and Counselor Education, deserve special mention since it was individuals in these Departments who actually carried on the many tasks, both large and small, which resulted in the project's accomplishments.

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I

ORIGIN AND IMPORTANCE OF THE STUDY

History of the VDS Project

The Vocational Development Study (VDS) Project was conceived and begun in the Department of Vocational Education at The Pennsylvania State University when it initiated a long-range research program in cooperation with personnel from the Altoona School District and the Altoona Area Vocational-Technical School during the late fall of 1968. Beginning in the Spring of 1969 data was first gathered from the ninth grade class in Altoona, Pennsylvania. In the Spring of 1971 similar data was gathered from the ninth grade classes in both Hazleton and Williamsport, Pennsylvania. As the vision of a ten year longitudinal study of the vocational development process began to take form in the minds of the faculty and graduate students then in the Department of Vocational Education at Penn State, a decision was made to request funds for the Project from the state Research Coordinating Unit (RCU) in Vocational Education. Up until that time, the project had been supported with departmental and university research funds. Beginning in April of 1971 the state RCU committed funds to the VDS Project to cover Phases I, II and III, and these funds continued over the subsequent three year period. Beginning July 1, 1974 the RCU committed funding for a one year period to cover Phase IV.

This report is an accounting of the project activities conducted during Phase IV. The report is entitled a Final Report, but it is final only in the sense that it brings to a close Phase IV of the VDS Project. It is intended that the project will continue for the additional time period necessary to complete the ten year commitment in each of the three school systems involved.

Since the above is only a brief overview of the background and objectives of the VDS project, the reader is referred to VDS monograph Number 1 (A Longitudinal Study of Vocational Development: Implications for Vocational Education and Guidance) for the complete rationale and design for the project.

This research study, planned to cover a ten-year span, has been designed to examine two distinct areas of concern: those that have implications for curriculum evaluation, and those having implications for vocational guidance. The design incorporates three separate analyses for each specific problem (one for each sample), resulting in a double cross-validation. These two problem areas are presented and described in the following outline. Phase IV of the VDS Project is concerned with time sequence T_5 of the overall design.

Objective and Time Sequence of VDS Design

I. Problems having curriculum evaluation implications

A. Time$_1$ (T_1) when sample [Altoona (A), Hazleton (H), and Williamsport (W)] leave ninth grade and begin tenth grade.

1. The nature of the inputs into the various curriculums [Vocational (total, plus each distinct shop or laboratory area)/Academic/General/Business/Home Economics] in terms of the variables are listed below:

a. Personal

i. Cognitive

(a) Aptitude

(b) Achievement

ii. Affective

(a) Vocational Maturity

(b) Occupational Values

(c) Tentative occupational aspirations

(d) Tentative educational plans

(e) Interests and hobbies

iii. Experiential

(a) School attendance record (grades 7-9)

(b) School grade record (Grades 7-9)

(c) Health status

(d) Other personal factors

b. Environmental

i. Socioeconomic status of family

ii. Father's and mother's occupational status and level

iii. Father's and mother's educational status and level

iv. Number of siblings in family unit

v. Characteristics of the regional labor market

vi. Other miscellaneous environmental influences

2. A comparison and analysis of the differences in those characteristics listed in #1 between the five major curriculums and among the distinct vocational shop or laboratory areas.

B. T_2, when sample (A, H and W) completes tenth grade

1. An analysis of the differential effects of the programs (Vocational/Academic/General/Business/Home Economics) upon students' changes in vocational maturity level, changes in occupational values, changes in occupational aspirations and educational plans, the stability of occupational aspirations over time, the stability of educational plans over time, their stated satisfaction level with the program they have entered, and their self-concepts when the effects of significant variables listed in A.1. are considered.

2. Analysis of the differential effects of the individual vocational shop and laboratory courses of study (auto mechanics, auto body, carpentry, machine shop, etc.) upon those same changes as referred to in #1, immediately above.

3. An analysis of the relationship between the characteristics listed in #1 and degree of success in each curriculum.

C. T_4, when sample of vocational students (A, H and W) in selected shop and laboratory areas complete twelfth grade.

1. An analysis of the differential effects of the individual vocational shop and laboratory courses of study upon achievement on the Ohio Trade Achievement Test (OTAT) when compared to a national norm.
2. An exploration and validation of the OTAT in terms of its relationship with shop grades, mechanical aptitudes, prior achievement, and degree of work experience possessed by the sample.

D. T_5, when samples (A, H, W) after graduation have been out of school for approximately one year.

1. An analysis of the differential effects of the programs (Vocational/Academic/General/Business/Home Economics) upon the students' occupational or educational status, occupational or educational mobility, occupational or educational performance, and degree of satisfaction with current occupational or educational pursuits, when the effects of significant variables listed in A.1 and B.1 are considered.
2. An analysis of the differential effects of the individual vocational shop and laboratory courses of study (auto mechanics, auto body, carpentry, machine shop, etc.) upon those same dependent variables listed in D.1.

E. T_6, when samples (A, H, W) after graduation have been out of school for approximately four years.

1. An analysis of the differential effects of the programs (Vocational/Academic/General/Business/Home Economics) upon the students' occupational or educational status, occupational or educational mobility, occupational or educational performance, and degree of satisfaction with current occupational or educational pursuits, when the effects of significant variables listed in A.1, B.1 and D.1 are considered.

2. An analysis of the differential effects of the individual vocational shop and laboratory courses of study (auto mechanics, auto body, carpentry, machine shop, etc.) upon those same dependent variables listed in E.1.

F. T_7, when samples (A, H, W) after graduation have been out of school for approximately seven years

1. An analysis of the differential effects of the programs (Vocational/Academic/General/Business/Home Economics) upon the students' occupational or educational status, occupational or educational mobility, occupational or educational performance, and degree of satisfaction with current occupational or educational pursuits, when the effects of significant variables listed in A.1, B.1, D.1, and E.1 are considered.

2. An analysis of the differential effects of the individual vocational shop and laboratory courses of study (auto mechanics, auto body, carpentry, machine shop, etc.) upon those same dependent variables listed in F.1.

II. Problems having vocational guidance implications

Validation of a variety of tests and inventories with potential for the guidance of students in the selection of various school programs.

Background of the Problem

The wealth of any nation is based upon its ability to effectively educate and utilize its human resources. As compared to natural resources, human resources may be described as the catalysts which transform an idea from an abstract concept into goods and services. Thus, it is the people oriented approach to the development of the nation's resources.

The problems associated with the development of human resources generally fall into two categories: underemployment and underdevelopment. An individual who is underemployed is usually employed, but at a level below his capabilities, Underdevelopment, on the other hand, refers to the posture of a country whose human resources are not developed to their fullest potential. Thus in order for a country to progress and achieve a high standard of living, its manpower must be developed to a level equal to the capabilities of its citizens.

Historically, the United States has pursued only two human resource policies. One is immigration and the second is public supported education. The manpower supply/demand ratio was regulated with the use of the first policy, immigration. This policy placed little emphasis upon education and,

for the most part, concentrated upon the training of workers to fill specific jobs. Global human capabilities (e.g., reasoning) must be developed through education, while training is reserved for specific tasks (e.g., repairing a specific element after its difficulties have been identified.).

The second policy, public supported education, is the most widely used vehicle for the development of human resources. Formal education is perhaps the most common and effective method for the development of the skills, knowledge and capabilities of individuals, who represent this or any nation's human resources.

The increase of public support for education demonstrates this nation's commitment to the educational development of its citizens. The overriding rationale for this dominance is the concern of manpower planners for eliminating the waste or under utilization of human resources in terms of skills and abilities.

Vocational education has continually enjoyed federal support for its programs since President Lincoln signed the Morrill Land Act in 1862. This act demonstrated the nation's first attempt to promote education and training for employment. However, this act did not provide funds for educational and training at a level less than college.

As a result of the increased growth in the economy and the lack of trained manpower from abroad, it became evident that additional programs were needed beyond high school, but less than college, to fill this void. Efforts by the industrial and educational community resulted in the passage of the Smith-Hughes Act in 1917. This act provided the federal government's first major impetus for non-baccalaureate vocational education. In addition, this act provided not only the precedent, but also the model for subsequent legislation which focused on the vocational manpower requirements of society.

This trend was not changed until the decade of the 60's. Influenced by the increased social conscience of the 1960's, Congress developed and enacted into law the Vocational Education Act of 1963, which centered upon people in need of vocational education, rather than upon the requirements of occupational areas as previous acts had done. This Act clearly demonstrated a philosophical shift in the objectives of vocational education, indicating a national concern for the development of human resources as a capital investment.

As a result of a report submitted by the advisory council charged with reviewing the 1963 Act, changes were recommended which resulted in the Vocational Education Amendments of 1968. In addition to making the 1963 Vocational Education Act more flexible, the 1968 amendments emphasized programs which were designed to respond to the needs of people, so that education and training would be available to any individual who might profit from it.

These considerations have clear-cut implications for educational policy and curriculum decision making. Educational institutions are being called upon with increasing frequency to provide answers to the many and varied problems created by technological growth, especially those problems concerned with human resource development.

One of the outcomes of the socio-educational process should be the merging of all forces which act upon an individual so that the individual is able to deal effectively with the environment. In addition, the process by which the individual makes choices related to the adult world must be explored and the components of this process need to be identified. Whatever the individual chooses to do, enter the labor force either inside or outside the home, pursue further education or training, or enter the military, the more assistance in the form of information the individual has, the better able

he or she is to make that decision. Work, although entered at different times, is an integral part of an individual's environment. The ability of an individual to work consistently, and to receive satisfaction from this work, is necessary if society is to reduce wastage in terms of its human resources. Work satisfaction and satisfactoriness must become a concern for educators if society is to fully develop its human resources.

Since high school represents, for some, the last experience with a formal educational situation before entering into a lifetime of work, consideration must be given to in-school student characteristics and variables. It is with these variables that the school is able to deal and promote change related to the total growth potential of the individual and to the well-being of society.

The Problem

This research endeavor will be concerned with two distinct components of the relationship between the secondary and post secondary experience of youth. These components are: an evaluation of existing programs in relationship to the world of work and post secondary education, and an examination of the vocational development process of young adults.

Objectives

The general objective of this study is to make it possible to examine the post high school experiences of youth in Pennsylvania in terms of Success (Satisfactoriness) and Satisfaction. In order to capitalize as much as possible on previous data collection and research, the study will focus on the three Pennsylvania school systems (Altoona, Hazleton, and

Williamsport) which were extensively involved in an ongoing VDS Project conducted in the Department of Vocational Education at The Pennsylvania State University since late 1968. Although all subjects in the study proposed here will have been out of high school approximately one year, much of the data necessary to relate their out of school experience (work or further education) to their in-school activities and characteristics already exist. The two main components of this study are: (1) an evaluation of the effectiveness of the high school experience as a preparation for work or further education leading to work; and, (2) an examination of the vocational development process as it relates to post high school youth. The specific objectives of this study are:

1. To collect all relevant data concerning the post high school experiences of the 1974 graduating classes of the Hazleton and Williamsport, Pennsylvania, school systems. The questionnaire designed for collection of this data is presented in Appendix A. This questionnaire is the same as that used to collect data on a similar sample of Altoona students who graduated in June of 1972.
2. To transform this raw data into its most usable form and store it on computer tape, merging it with previous in-school data already collected on these samples.
3. To provide the Hazleton and Williamsport school systems with comprehensive follow-up information on their graduating classes of 1974.
4. To maintain and update the current data tapes from all three samples in order to make it possible for other studies to be conducted. This data will be made available for a range of possible studies by faculty and graduate students at the Pennsylvania State University, Lehigh University, and elsewhere. Proper care will be taken to assure confidentiality of the data.

5. To conduct and report on a comparative study of the post high school experiences of graduates of the three school systems (Altoona, Hazleton, and Williamsport) in terms of employment status, post high school institutions, high school experiences, and other pertinent variables.
6. To provide for cooperative research endeavors among the faculties and graduate students of the Departments of Counselor Education and Vocational Education through making data and technical assistance available. Also, to provide for cooperative research endeavors among Penn State College of Education personnel, Pennsylvania school systems, and the Pennsylvania Research Coordinating Unit for Vocational Education.

Design

The general design for this study involves the collection of the data necessary to conduct the comparative study described in objective number 5 and fulfill the objectives set for time sequence T_5 (page 5) of the overall general design of the ten year longitudinal VDS Project. The collection of the data will serve the purposes described in all other objectives. Because this data will be added to the data bank previously established, the general design could be properly described as longitudinal; however, the particular study described under objective 5 is cross-sectional in nature.

II

PROCEDURES

Study Samples

The Department of Vocational Education at The Pennsylvania State University undertook a ten-year longitudinal Vocational Development Study (VDS) in the Fall of 1968. All data for this study were collected as part of this continuing longitudinal study of career development. This study is currently being conducted jointly by the Department of Vocational Education and the Department of Counselor Education at The Pennsylvania State University in cooperation with the Research Coordinating Unit of the Pennsylvania Department of Education. The initial data were collected during the fall of 1970 when the attempt was made to include all ninth graders of the Hazleton and Williamsport components of the entire VDS Project. The project was developed to identify the effects of the high school experience on youth and relate the knowledge to curriculum planning and vocational guidance.

The current sample consists of the total ninth grade enrollment in 1970 in three medium sized Pennsylvania school districts: Altoona (A), Hazleton (H) and Williamsport (W), who have now completed one year beyond high school graduation.

In designing the study, an attempt was made to select schools with a large vocational-technical school enrollment, thereby making the choice of a vocational program a realistic alternative. It was felt that an attempted 100 percent sample of three large school systems would combine many of the advantages of Super's Career Pattern Study which used a small sample and the advantages of Project Talent's large sample.

Data is being retained for any student dropout or any student who transfers out of the school district. Though incomplete data is available on this type of individual, sufficient information may be present for particular investigations. To make the present data as complete as possible, considerable effort has been expended in make-up and follow-up activities. For those students who have been part of the sample throughout the entire time period investigated, the data is virtually complete. Overall, of all the students who have ever participated in the sample, data exists for about 85 percent of any sample on any single variable.

This study was concerned with the one-year graduation follow-up of both the Hazleton and Williamsport components of the overall VDS Project. The following is a description of both the Hazleton and Williamsport, samples and communities, used in this study.

Hazleton

Sample

The Hazleton area sample was added to the VDS project in 1970. All high school students from three public high schools and one parochial high school who were to graduate as the classes of 1974 were included in the sample. The Hazleton area sample consists of approximately 1,000 students.

Initial data on the Hazleton students were collected in the Spring of 1971 when the sample was completing ninth grade (see Table 1). At that time student abilities, interests, values, and biographical information were tested and inventoried. During the Summer of 1971, junior high school records were reviewed and student grades, attendance records and other test information were collected. During the Spring of 1972 tenth grade data were collected, and during the Spring of 1974 twelfth grade data were collected. Follow-up data for this sample were collected in the Spring of 1975.

Community

There are many environmental factors which have an effect on student development and decision making. This section describes the social and economic background of the Hazleton community. This description is intended to give the reader an understanding of those community factors which effect the Hazleton student sample and has been obtained from such sources as Hazleton Planning and Zoning Commission, Chamber of Commerce and League of Women Voters.

The city of Hazleton, population 30,426, is located in Luzerne County Pennsylvania, approximately 25 miles south of Wilkes-Barre. The city has

recently given itself the title 'Crossroads of the East," heralding its location, just six miles from the intersection of Interstate Routes 80 and 81. This transportation network, reaching from New York to San Francisco and from Canada to the Gulf of Mexico, has opened new horizons for the city, providing good transportation facilities to prime market areas.

Hazleton's early growth came about as a direct result of the anthracite coal mining industry. By 1850 coal had become the prime industry of the region, reaching its peak during the first and second world wars. Prior to the current energy crisis, the declining demand for coal because of gas and oil substitutes destroyed the economic well being of Hazleton and the entire anthracite region.

Consequently, Hazleton has been declining in population since 1940. It lost 6.6 percent in that decade, 9.7 percent the following decade, and 5.1 percent in the last decade. These losses have resulted in significant changes in the city's population characteristics. Unlike many metropolitan areas in the United States, Hazleton's decrease in population cannot be attributed to people moving to suburban areas outside the city. In this case, not only Hazleton but all of Luzerne County has shown a decline in population due to the reduction of the area's principle economic activity, coal mining.

Economy

Like many other communities in the Anthracite Region, Hazleton has had a substantial labor surplus. However, the textile industry has helped alleviate part of this economic problem. Non-durable goods tend to dominate the economy of the area. Textile and apparel plants are the major employers with retailing providing strong support. The manufacturing of durable goods, which rose significantly during the 1950-1960 period, makes it the third ranking industry in the area.

In 1956 the Community Area New Development Organization (CAN-DO) was formed. This organization, an outgrowth of the Hazleton Industrial Development Corporation (HIDC), sought to secure the capital necessary for building new industrial plants. Through these programs, sufficient money was raised to buy a 500-acre tract which in now Valmont Industrial Park. CAN-DO went on to raise 2.5 million dollars to develop the industrial complex, establishing approximately 30 new industries and providing over 5,000 jobs for its residents. The Hazleton area has now achieved some economic diversity and although the coal, textile, and apparel industries continue to be important, they are now only a segment of the economy. They share the market with industries producing such diverse items as paper products, office furniture, bread, shoes, foam rubber, lighting fixtures, mobile homes, steel cabinets, plastics, bottling, and canning components.

In the finance area Hazleton's major source of revenue is obtained through levies against real property. These taxes consistently account for more than half of the city's revenue. Annually the property tax levy has ranged between 1.8 and 2 percent of the total assessed valuation of property. Other sources of revenue are a one percent earned income tax, occupational taxes, per capita tax, and a real estate transfer tax.

Housing and Land Use

One of the most significant barometers of a community's economic and social status is the housing in which the residents live. The quantity and quality of the housing supply in Hazleton reflects the economic history of the city.

A majority of Hazleton's homes are one-and two-family detached dwellings situated on small lots. More than 80 percent of the housing units were built

before 1940. The effects of age and low maintenance are visible throughout the city, particularly in the older sections. Uncontrolled additions and alterations by way of an added room, garage, porch, or a whole dwelling unit have significantly contributed to the deterioration of these areas in the absence of control.

While Hazleton's population has been declining, the quantity of housing has increased. The result has been a decreased in housing density, and fewer people per housing unit. At the same time, the number of less desirable houses increased, with a consequent increase in vacant housing units.

The general economic conditions in Hazleton have hindered the remodeling and construction of housing units. Investment in residential construction actually declined during the period of 1954-1959, when post second world war construction was at its peak. During the period 1950-1955 it reacned an annual low expenditure of $399,000.00. Though housing investments have risen appreciably in recent years the city is still deficient in its overall level of modern housing.

Downtown Hazleton is the site of a municipally administered two square mile area of public housing for low income families. Hazleton has also sought to correct some housing problems through federally funded urban renewal. A plan drawn up in 1965 calls for clearance of four square miles of slums. Part of the land cleared is to be used for housing, part for commercial establishments, part for private residences, and part for public parking.

Hazleton expects the application of zoning regulations in conjunction with a comprehensive land-use plan to improve housing in the Hazleton area in future years. These plans plus the growing economic well being of the community should have a significant effect in improving housing in the next decade.

Mixed land uses characterize Hazleton since no zoning ordinances existed until 1962. The adverse effects of this mixture have contributed to some of the deterioration of residential properties located near industrial establishments. Strip mining, with its smoke, dust, and vibration from blasting, has also contributed to lessening the desirability of nearby land. To alleviate some of these problems a comprehensive land-use plan was adopted in 1965. This plan is intended to control growth, provide minimum standards, control population density and eliminate unnecessary traffic.

Transportation

With the demise of coal mining and the use of diversified industry the railroad did not provide the economical low volume transportation that became necessary. For this reason Hazleton fought hard and successfully to have the intersection of Interstate routes 80 and 81 located near Hazleton. As a result of this effort Greater Hazleton has six interchanges on the interstate freeway system, with a segment of Interstate route 81 providing a north to south bypass of the central city.

Augmenting the interstate network are the CAN-DO Freeway, connecting the interstate system with downtown Hazleton; a four-lane highway connecting Valmont Industrial Park with the city and interstate system; and a four-lane connection between I 80 north of the city and I 81 south of the city. This impressive highway network in combination with Hazleton's nearness to the large metropolitan areas of the east, 2 hours to Philadelphia, 2-1/2 hours to New York, and 3-1/2 hours to Washington, is undoubtedly Hazleton's greatest hope for future development.

The combination of new highways and new industries has brought development of major trucking facilities to Hazleton. Two trucking firms have terminals in the city, while most major carriers service the area.

Hazleton also has an airport with commuter service to New York and Philadelphia. Two interstate bus systems service Hazleton and intra-urban passenger service is provided by local bus firms. Railroad freight service is in operation, but no passenger service is available.

Social Characteristics

The heart of a community and its associated problems lie in the people of the community and their relationship to physical, social and economic factors. While people influence the conditions under which they live, they also suffer from the deficiencies created. It would seem that problems of the physical and economic environment are directly related to the psychological and social environment of the population. When the social characteristics of Hazleton such as unemployment, education, income, age, and race are combined with the physical characteristics, the social needs of the population can more accurately be evaluated.

The ethnic makeup of Hazleton reflects the European stock which settled there to work in the mines. The majority are from German, Irish, or Slavic backgrounds. Many of the older inhabitants are first generation Poles, Czechs, Hungarians, or Italians. The cultural history of Hazleton is reflected through some of the churches in the community. The first Slovak Roman Catholic Parish in the United States is in Hazleton as well as the only Tyrolean Roman Catholic Parish.

Employment figures from the 1970 census indicate that 73.9% of the males over sixteen years of age are in the Hazleton labor force. For this group unemployment was 4.1%. Of the females over sixteen years of age, 40.7% are in the Hazleton labor force. Of this group, 3.7% were unemployed. The U.S. Department of Labor, Manpower Administration has classified all of Luzerne County as an area of substantial unemployment because it meets the 6% unemployment criteria based on 1971-72 data.

The mean family income in Hazleton in 1970 was $9,373 as compared to the Pennsylvania mean family income of $10,877. Of several major third-class cities in Pennsylvania, the citizens of Hazleton are the least mobile. Of the Hazleton population 72.2% were living in the same house in 1970 as in 1965. This is explained in part by the lack of new housing outside the city to which people would ordinarily move.

Like any other city, Hazleton has its social problems, high school dropouts, juvenile delinquency, welfare recipients, unemployment and under-employed individuals, the causes of which are almost impossible to determine and difficult to correct. In many cases the problems result from a combination of social, physical, psychological, and economic determinants.

Educational System

Public education in the Greater Hazleton area is the function of the Hazleton Area School District. Instituted in 1966, it combined 16 former districts into one to serve a population of 70,000. From this population it draws approximately 13,000 students. The district has three senior high schools, a vocational-technical school, five junior high schools, an intermediate school and 22 elementary schools.

The Hazleton Area School District is operated by a nine-member, non-salaried school board elected for six year terms. The 1970-71 budget was 10.7 million dollars. State appropriations yielded approximately 5.5 million of this amount. The 1969-70 cost per pupil was $705.00. A total of 638 classroom teachers and supervisory personnel provided education to 12,442 pupils during the 1970-71 school year.

In 1968 a comprehersive ten-year plan involving all aspects of the public educational program was presented to the school board. The greatest problems discovered were the inadequacies of the school buildings. Many of

the structures need extensive modernization. Many are old and need to be replaced. The report also forecast serious overcrowding, particularly at the high school level. While the report recommended building of a new high school, the school board has chosen to undertake a program of renovating and adding rooms to existing high schools. They also are adding a number of new elementary schools to the district.

The Area Vocational-Technical School has been in operation only four years, but has developed outstanding programs and fills a genuine need in the Greater Hazleton community. It has twenty-three shops with a total of 110,000 square feet of space. Students in the tenth grade may enter a variety of three-year programs. Half of the student's day is spent in one of the area high schools, the other half at the voc-tech school. Approximately 650 students are enrolled in the following occupational courses: Auto Body, Auto Mechanics, Carpentry, Commercial Art, Cosmetology, Drafting, Distributive Education, Electricity, Electronics, Farm Mechanics, Food Service, Graphic Arts, Health Assistance, Horticulture, Masonry, Machine Shop, Mechanical Drafting and Design Technology, Millwork and Cabinet Making, Plumbing, Scientific Data Processing, and Welding. The vocational-technical student pursues an occupational area at the voc-tech school while taking general subjects at his home high school.

A high school student not attending the voc-tech school will pursue one of the curriculum alternatives. The College Preparatory Curriculum (academic) requires a foreign language sequence and advanced mathematics. The student then chooses his other academic courses along a scientific or liberal arts track. The General Curriculum provides the student with the basic required courses in English, history, math, and science. More electives may be chosen in this curriculum than any other. Students who elect to pursue the

Business Curriculum take a sequence of courses in bookkeeping or stenography. Those who are in the Distributive Education Curriculum take required general courses and a distributive education course. In the eleventh year the distributive education course is a half-day session at the voc-tech school and in twelfth grade these students undertake a supervised half-day work experience.

Two other alternatives to the Hazleton Area High School students are available outside the public school system. The Scranton Diocese operates Bishop Hafey High School, a completely new facility with an enrollment of 415 students. The Mining and Mechanical Institute, located in Freeland, is a college preparatory school with emphasis in the engineering professions. McCann's School of Business provides Hazleton with post-high school stenographic and accounting courses for approximately sixty students.

The Keystone Job Corps Center for Women, operated by the RCA Service Company, provides vocational training and social skills for approximately 500 girls who come from low income families all over the United States.

The only institution of higher learning in the community is the Hazleton Campus of The Pennsylvania State University. In operation since 1934, if offers two years of work toward a Baccalaureate Degree and a two-year Associate Degree program. Current enrollment is about 800 students. A variety of evening classes serve about 600 to 700 persons each term.

Williamsport

Sample

The second sample used in this study was the Williamsport Area High School Class of 1974. This sample consists of approximately 900 students. Initial data on the Williamsport students were collected in the Winter of 1970-71 (see Table 2). At that time student abilities, interests, values, and biographical information were tested and inventoried. During the Summer of 1971, junior high school records were reviewed and student grades, attendance records, and other test information were collected. Tenth grade data collection took place in the Spring of 1972. The twelfth grade data collection contained the same tests and inventories that were included in the ninth and tenth grade administrations with the additions of a twelfth grade questionnaire. This questionnaire was the same as that given to the Hazleton sample and is a revised version of the Altoona questionnaire. The one-year after graduation follow-up was conducted in the Spring of 1975. The results of that follow-up are presented in this report.

Community

There are many environmental factors which have an effect on student development and decision making. This section describes the social and economic background of the Williamsport Community. This description is intended to give the reader an understanding of those community factors which effect the Williamsport Student Sample. This information has been gathered from the Williamsport City Planning Commission and the Greater Williamsport Chamber of Commerce. This information has been supplemented by data from the 1970 United States Census.

Williamsport is located in north central Pennsylvania on the West Branch of the Susquehanna River in Lycoming County. The city is situated in the foothills of the Allegheny Mountains. It is bounded by the Susquehanna River to the south while to the north a vast range of moderate hills extends five or six miles. Now famous as the birthplace of Little League Baseball, Williamsport once was known as the "Lumber City." In 1870, a log boom extended 20 miles up the Susquehanna River; 300 million feet of sawed lumber were produced each year. When the lumber was exhausted, the city turned to major industries, and remained relatively prosperous.

History

In the late 18th century, Williamsport's location on the West Branch of the Susquehanna River was remote. So, unlike most cities, Williamsport did not "just happen." The City grew as a result of a long series of decisions and efforts to overcome its location disadvantages.

Michael Ross, in laying out the older portion of Williamsport, was primarily concerned with demonstrating the reasonableness of the site for development as a county seat, knowing that designation as such would spur development. When Williamsport was chosen as the county seat in 1796, nothing more existed than a survey of its streets. Williamsport was chartered as a Borough in 1806 and incorporated as a city in 1866. A significant reason for Williamsport to be chosen as Lycoming County seat was its large amount of levelland, located on a terrace some 25 feet above normal river levels and access to the hopefully navigable Susquehanna River. The scarcity of Level land in the region had provided few desirable sites, and thus the threat of floods was a risk to be taken.

The origin of the name Williamsport has long been in doubt. The descendants of Michael Ross, who founded the town, have claimed that he had it named for his son William. The more plausible explanation is that it was named for William Russell who had charge of the wharf where the river boats tied up. The rivermen were accustomed to referring to the place as "the port," afterward "Bill's Port," and finally "Williamsport."

When efforts to make the Susquehanna River navigable for commerce failed, alternative means of transportation were necessary for the City to overcome its remote location. The authorization of the Pennsylvania Canal to Williamsport in 1828 was the first significant success in the struggle for survival. It and subsequent rail lines made development of the City as the lumber capitol of the world possible. Between 1828 and 1890, the City population grew from 800 to 27,132. Williamsport established itself as a trade center following canal and rail line construction, exporting the region's lumber, coal, and iron resources. Williamsport, as did other similar but smaller communities (Sunbury, Milton, Lock Haven, etc.), found the plains adjacent to the river ideal for location of factories and homes.

The 1889 flood which destroyed the City's sawmills and lumber stock ended a half-century boom era and commenced a long period of economic uncertainty. Technological changes severely curtailed the usefulness of bituminous coal as a fuel and made the low grade iron ore found in the region uneconomical for processing. Without natural resources, the region lacked natural incentive to attract new industry. Constant community attention has been given to building and maintaining a diversified industrial base.

Population

Population growth in Williamsport is tied directly to its development as an employment center. Designated as the County seat for Lycoming County

in 1796, population growth until about 1850 was a result of this administrative role. In 1850, the population of Williamsport was a meager 1,615. Unlike many Pennsylvania cities at that time, Williamsport did not have the agricultural base to foster growth as an agricultural trading center.

The bulk of Williamsport's population growth occurred in the four decades following the establishment of the City's famous lumber industry. Growth during this period was phenomenal. In one respect, Williamsport's 1890 population was the high point of the City's growth, having experienced a 43 percent growth during the previous decade. The flourishing lumber business was nearly destroyed by the 1889 flood and with unreplenished forests, never completely recovered.

Growth from 1890 to 1930 was steady. An enormous industrial sales effort resulted in many new industires being attracted to Williamsport despite its remote geographic location. Service industries grew to provide for the industrial and residential markets. The growth rate from 1890-1900 was six percent; 1900-1910 was 11 percent; 1910-1920 was 13 percent; and 1920-1930 was 26 percent. The 1930 population was 45,729.

During Williamsport's most recent period, 1930-1970, population growth has changed to population decline. Population declined three percent in the decade of the 1930's and rose only two percent in the 1940's. The next two decades demonstrate sharp declines. Population declined seven percent between 1950 and 1960 and decline was ten percent between 1960 and 1970 lowering the number of residents to 37,918. This recent trend is evidence of the population move to suburban areas. In 1930, 74 percent of the Greater Williamsport area population lived in the city, but by 1970 this percentage had slipped to 52 percent. The city is undergoing a natural shift toward commercial and

industrial functions and away from its residential function. Projections for Williamsport's population have been given by the Lycoming County Planning Commission. The trend given is for a slight decline continuing to 1980 reaching a population low of 36,500 and then a modest increase to the year 2000 with the population reaching 40,400.

Economy

Historically, Williamsport established itself as a trade center following the mid-19th century construction of canal and rail lines up the Susquehanna River. The 1889 flood in Williamsport which destroyed the City's sawmills commenced a long period of economic uncertainty. Attention necessitated by the communities remoteness, strove to replace the lost industries.

The Williamsport Board of Trade raised a substantial sum of money to finance the settlement of 34 new industries between 1900 and 1910. Between 1933 and 1938, the Williamsport Committee of One Hundred obtained 14 new industries for the area to offset depression losses. The Williamsport Industiral Properties Corporation, using local and state capital, developed the Williamsport Industrial Park. Approximately 20 industries have located in the park since 1960. Currently, estimated manufacturing employment within the park is 2,000 persons, which is approximately ten percent of the County total of 19,795 manufacturing employees. Equally important to Williamsport's economic stability is the mix in industry, no single firm, nor type of industry dominates as was true during the lumber boom.

Significant also to the improved economic conditions is highway construction. The Williamsport Chamber of Commerce plus Susquehanna Valley legislators have historically pressed for improvements to the Susquehanna Trail,

U.S. Route 15. The Williamsport beltway, now under construction, will be part of an improved U.S. Route 15 between Rochester and Harrisburg. Strong local lobby efforts also aided in the completion of the Keystone Shortway (Inter-state 80) which adds markedly to the assessibility of Williamsport.

A study of the economic conditions of Williamsport is very much a study of Lycoming County since the economy of the City is so interrelated with that of the county. The dominate economic activities in Lycoming County are manufacturing, wholesale and retail trade, and services. These three categories account for approximately 85% of the employment, with manufacturing clearly the dominate economic activity, accounting for about half of the employment and wages.

Commercial activities in Lycoming County follow the pattern of manufacturing in that there is considerable diversification. In comparison with all of Pennsylvania, there is greater activity in the County in building materials, farm equipment, furniture, home fixtures, transient lodging, amusement, and recreational services. On the other hand, there is less activity in educational and miscellaneous services.

The future economic growth of Williamsport is difficult to predict because of the multitude and complexity of all the variables involved. Williamsport's competitiveness with other regions or communities in terms of accessibility, labor supply, building sites, utility services, and official attitudes will influence its development and future economic stability.

Housing

All of the social and economic aspects of a community are closely related to its level of housing. The physical structures which people live in are accurate barometers of their progress. Nothing of a physical nature relates more to the way people develop socially and economically than the housing supply.

Williamsport has had fewer residential structures built in the last 20 years than any other major Pennsylvania city. This reflects the declining population of the city over the past 20 years. Only 7.8 percent of the houses in Williamsport are less than 20 years old compared to the statewide figure of 31.9 percent. Of the existing residential structures in Williamsport, 88 percent were built prior to 1940. Only four percent of the city's residential structures were built between 1960 and 1970.

Williamsport has fewer detached single family homes than the state average, 45.5 percent for the city compared to 53.6 percent for Pennsylvania. But, in comparison with most Pennsylvania cities where attached housing predominates, Williamsport has many more single family dwellings.

The city of Williamsport is composed of five neighborhoods, West End, Central, North End, East End, and Downtown. Comparison of structural characteristics between neighborhoods exhibits the following pattern. The largest and most expensive dwellings are found in the North End, the smallest and least expensive are in the Downtown, and the three remaining neighborhoods have comparible characteristics.

The West End neighborhood is the largest in land area and the oldest section of the city, but at the same time has the city's most recent development, including the Williamsport Industrial Park, Williamsport High School, and several new rental housing projects. In comparison to the West End, the Central neighborhood is densely populated. Though primarily a residential area, there are two industrial complexes in the neighborhood. The North End is characterized by single family dwellings and nearly total absence of commercial or industrial uses. The East End is predominately residential. This area, though favorable for residential use has experienced high deterioration due to low income and possible beltway construction. The Downtown

neighborhood, influenced by beltway construction, the community college and urban renewal, is in an era of rapid transition away from its former mixed function as a place to live as well as work, to an exclusively work function.

Williamsport has a comparatively low percentage of its total dwelling units in owner occupancy, 49 percent compared to 65 percent statewide. This is due to high transient rates and high numbers of low income persons. Equally significant is the city's low vacancy rate. This is undoubtably a result of increased college enrollments and demolition of homes as a result of the beltway and urban renewal.

Land Use

Williamsport has a total land area of 9.1 square miles; approximately 70 percent of this area is developed, 30 percent vacant. Residential land constitutes the largest single use of land in the city, about 21 percent of the total land or 36 percent of the developed area is used in this manner. About ten percent of the land is commercial and industrial, while streets, railroads and public utilities cover 27 percent of the city's land use.

As previously stated, the city has grown in an east-west direction along the Susquehanna River bank. Early growth was close to the river. Much of this area is now in a dilapidated condition because of age and the effects of former floods.

The Susquehanna River location demands a substantial investment in bridges for accessibility within the Williamsport area and from the area to other state and national regions. Adequate bridges have been a historic problem in Williamsport due to their inherently high cost and periodic ice or flood damage. Because the Williamsport area is hemmed in by hills on both the north and south, future growth will require additional bridges or higher intensities of development.

Recurrent high waters and occasional disaterous floods demanded that the city construct or relocate protective dikes. Public and private investment in the city warranted construction of such a dike, which was completed in the early 1950's.

Commercial establishments are concentrated in the Central Business District, with less intensive uses dispersed throughout the residential parts of the city. The lumbering industry in the 1800's caused industry to locate closer to the river, and this pattern is still evident today. The 300 acre Williamsport Industrial Park continues to expand and will provide suitable industrial space for new industry over the next 10 to 20 years.

Finance

For three decades, Williamsport has been losing population and commercial enterprise to her surrounding suburban municipalities. At the same time, public service requirements have increased. In most cities, the combination of these two factors has brought financial chaos. In Williamsport the construction of new plants in the Williamsport Industrial Park, new homes along the northern city line and, to some extent, commercial and office construction in the Central Business District have maintained a slow growth in the city's total assessed valuation.

A major source of revenue for the city is derived from real estate taxes. In Williamsport the assessed value of real estate is 33 1/3 percent of 1957 market value for the city and library. Other revenue is obtained through per capita tax, $20 per resident over 21 years of age; income tax, one percent; occupational privilege tax, $10; and occupation tax, 160 mills on value of occupation. Other tax revenue comes from licenses, personal property, and real estate transfer.

Even with growth the city is not immune to financial hazards. Inflation, increasing numbers of low income people, increased demands for city services, and continued aging of structures all have an overall detrimental effect on the city's ability to meet its financial commitments. To meet those pressures, Williamsport is planning for future growth and expansion in a more structured way than has historically been the case.

Transportation

Transportation systems--road, rail, water and air--form the framework for physical growth and development. Their location and character effect growth and determine commercial and residential patterns.

It is apparent that, in the United States, overwhelming reliance is placed on motor vehicles as the primary mode of transportation. In Lycoming County, registration of motor vehicles increased 46 percent between 1960 and 1970. The city has difficulty in handling the recent increases in traffic. A major problem is thru traffic. Completion of the Susquehanna Beltway will remove much of this traffic from local streets, through other improvements to local streets are also needed.

Mass transportation in the form of bus service is available to the Williamsport resident, but here as throughout the country, the tendency is to shun public mass transit in favor of the private automobile.

The Reading Railroad and the Penn Central serve Williamsport with rail freight service. Having lost passenger service to the private auto and airlines, and much freight to trucking, the railroad's only remaining advantage is its ability to carry high volumes of bulk cargo. In Williamsport, the railroads service such bulk industries.

Truck terminals are an important industry in Williamsport, due to its location as the dominate center of north central Pennsylvania.

Williamsport-Lycoming airport is located 5 miles from downtown Williamsport. Daily commuter services are provided to Washington, Philadelphia, and Albany.

Social Needs and Characteristics

The heart of a community does not lie in its transportation system, inadequate housing, or public facilities. The heart of a community and its associated problems lie in the people and their relationship to physical, social, and economic factors. While people influence the conditions under which they live, they also suffer from the deficiencies created. It would seem that problems of the physical and economic environment are directly related to the psychological and social environment of the population. When the social characteristics of Williamsport, such as unemployment, education, income, age, and race are combined with the physical characteristics, the social needs of the population can more accurately be evaluated.

The ethnic makeup of Williamsport demonstrates its long existance with a stable population. Of the total population less than 10% are foreign born or have foreign born parents. Of the foreign born, Italians and Germans are the most prevalent.

By race, the largest non-caucasian population is Black, with 1,121 persons. Compared to 942 in 1960 this is a 19% increase. Increased concentration of Blacks has occurred in the Central neighborhood of Williamsport, while other areas have shown decreases. This clearly distinguishes a racial ghetto in sociologic terms, though it has not resulted in the extreme social problems characteristic of larger cities.

Employment figures from the 1970 census indicate that 70.5% of the males over sixteen years of age were in the Williamsport labor force. For this group unemployment was 4.8%. Of the females over the age of sixteen there were 38.7% in the labor force. Of the females, 3.2% were unemployed.

The mean family income in Williamsport in 1970 was $9,175 as compared to the Pennsylvania mean income of $10,877. Williamsport's mean family income is among the lowest of the Pennsylvania cities. The City's somewhat lower cost of living and the heavy out migration of the 25-44 age group are the primary causes for this figure. The City mobility characteristics are similar to the rest of Pennsylvania. Of the Williamsport residents 59% were living in the same house in 1970 as they were in 1965, as compared to the Statewide figure of 64%.

Like many other cities, Williamsport has social problems such as high school dropouts, juvenile delinquency, welfare recipients, unemployed, and underemployed individuals; the causes of which are almost impossible to determine, and difficult to correct. In many cases the problems result from a combination of social, physical, psychological, and economic needs.

Williamsport has recognized the relationship between areas of concentrated social problems and the inadequacies in various physical facilities such as housing. Through planning and community effort, Williamsport is working toward solutions of both its physical and social needs.

Educational System

The City of Williamsport is a part of the Williamsport Area School District, which also includes Lewis, Hepburn, Lycoming, Old Lycoming, and Woodward Townships (all in Lycoming County). The school district encompasses an area of 98 square miles and is under the administrative control of a nine-member board of school directors and one superintendent. The system follows the organizational concept of K-6-3-3.

There are 19 public schools in the district, 15 elementary, 3 junior highs, and one senior high. Of these facilities, all except 5 elementary schools are located in the City. The district's total enrollment is approximately 11,000. For the most part, the Williamsport Area School District has maintained structurally sound school building. However, remaining life expectancy indicates that immediate steps should be taken to bring about replacement of those schools no longer capable of providing effective service.

Despite an overall population loss in the Williamsport Area School District between 1960 and 1970, school enrollment has continually risen. The rise in school enrollments between 1958 and 1968, and leveling off since, can largely be attributed to high birth rates during the 1950's. The school enrollments are likely to decrease over the next decade if more recent trends in the birth rate continue.

Williamsport's high school was completed in 1971 with a capacity of 2,700 students. The present enrollment is 2,300. The school is complete with swimming pool, gym, auditorium, well equipped labs and shops, cafeterias, and a planetarium. Perhaps the only disadvantage to the facility is its remote location. Whereas the old high school was centrally located, the new high school in the northwestern corner of the city requires that all students be bussed to school.

A wide offering of courses are available to the students of Williamsport High School. All except the vocational courses are provided at the new high school. The vocational courses are offered at the Williamsport Area Community College.

The Williamsport Area Community College, formerly known as the Williamsport Technical Institute, is operated by 19 area school districts within a 10-county area. In addition to a comprehensive Liberal Arts and Science program, some 29 programs are offered leading to Associate degrees, and 21 programs lead to a certificate. This work is largely in the technical and vocational trades. In addition to its adult programs, the College provides area vocational technical services to Williamsport high school students and 14 other area high schools.

The Williamsport area has one four-year liberal arts college, Lycoming College. This school is related to the United Methodist Church and has an enrollment of 1600 students. The close-working relationship between the College and the City makes it an important entity in Williamsport.

Data Collection

Tables 1 and 2 list the characteristics identified as important variables in the overall study and the points in time that data were collected for the Hazleton and Williamsport components of the sample.

Table 1

Hazleton Data and Dates of Collection

Nature of Data	Year Grade	Collected 70-71 68-69 7	69-70 8	70-71 9	71-72 10	72-73 11	73-74 12	74-75 +1 Yr
School Grades		X	X	X	X	X	X	
Curriculum					X			
OTIS BETA		X						
Stanford Achievement Test (SAT)		X		X				
Differential Aptitude Test (DAT)			X					
Attendance		X	X	X				
Ohio Vocational Interest Survey (OVIS)				X		X		
Biographical Information				X				
Occupational Aspirations					X			
Post High School Educational Plans					X			
Hobbies and Interests				X				
Vocational Development Inventory (VDI)					X			
General Aptitude Test Battery (GATB)				X				
Occupational Values Inventory (OVI)					X			
Vocational Preference Inventory (VPI)						X		
Ohio Trade Achievement Test (OTAT)						X	X	
Vocational Shop Code							X	
High School Comments							X	
One-Year Follow-Up								X
Post H. S. Occupational Status								X
Post H. S. Educational Status								X
Job Satisfaction								X

Table 2

Williamsport Data and Dates of Collection

Nature of Data	Year Grade	Collected 70-71 68-69 7	69-70 8	70-71 9	71-72 10	72-73 11	73-74 12	74-75 +1 Yr
School Grades		X	X	X				
Attendance		X	X	X				
California Test of Mental Maturity (CTMM)			X					
Metropolitan Achievement Test (MAT)		X						
Iowa Test of Educational Development				X				
Occupational Interests Inventory			X					
Biographical Data				X				
Occupational Aspirations				X	X			
Post High School Educational Plans				X	X			
Hobbies and Interests				X				
Vocational Development Inventory (VDI)				X	X			
General Aptitude Test Battery (GATB)				X				
Occupational Values Inventory (OVI)				X	X	X		
Curriculum					X			
Vocational Preference Inventory (VPI)						X		
Ohio Trade Achievement Test (OTAT)						X	X	
Ohio Vocational Interest Survey (OVIS)						X		
High School Comments							X	
One-Year Follow-Up								X
Post H. S. Occupational Status								X
Post H. S. Educational Status								X
Job Satisfaction								X

Instrumentation

One Year Follow-up Questionnaire

A one year follow-up questionnaire (Appendix A) was designed for use with the Altoona sample. The questionnaire was redesigned for the Hazleton and Williamsport samples to allow for different input from each school system into the follow-up process. Each of the three school systems was given the opportunity to provide some of their own questions on the questionnaire, thus allowing direct student feedback that they might otherwise not have.

The questionnaires consisted of four parts. All persons were asked to answer Part A, while questions in Parts B, C and D were directed specifically to those presently in school, employed, or unemployed and not in school.

Data Handling and Storage

Data Coding

One of the most time consuming jobs in the handling of data after its initial collection is coding. Coding is necessary for many of the variables collected so that the information can be segmented into major categories. One example of coding would be the classification of salary into distinct categories. On the one year follow-up, the graduates of Hazleton were asked to list their weekly salary. Rather than working with values which could run from a very few dollars to several hundred dollars per week, it is convenient to categorize salaries using five to ten divisions which logically fit the data.

Another example of the necessity of coding data is reflected in the classification of occupations. A most important, and re-occuring question throughout this study is: What occupation do you intend to enter when your schooling is completed? The most complete index of occupations in America

is recorded in the Dictionary of Occupational Titles (DOT), published by the United States Employment Service. The most recent edition, 1965, of the DOT lists 21,741 separate occupations with 35,550 different titles. Because of this wide range in possible occupations, it becomes essential to use a classification system to make the data useable. In the case of occupations, Anne Roe's classification system of field and level was selected for coding. This system classifies all occupations into eight fields and six levels or forty-eight separate categories, a reasonable and manageable number. Previous research with the Roe classification system has shown it to be a viable manner in which to view occupations.

Methods of coding must be selected so that the data is simplified and yet retains the original information. The coding process then, becomes more than merely a time-consuming necessity, it is essential in maintaining the validity of the data collected.

Editing

An important step in the handling of data is the editing of information. Some data will always be collected that for various reasons is inaccurate. Students will sometimes misinterpret the directions or fail to completely fill-out the test instruments. Occasionally students will write facetious answers, which on inspection can be eliminated from the data. For whatever reasons, these invalid responses need to be eliminated from the data to insure the validity of the data. This is done by visually editing the information collected from the students. This necessary, but time consuming step, can often be combined with the operation of transferring information to coding sheets. The people who perform this task are instructed in the necessity for accurate information. The same person begins, follows through and completes each coding task and editing step so that maximum reliability is maintained.

Another editing phase can be used to insure the accuracy of the data on tape. In this case, rather than manual inspection as indicated above, a computer program is used to identify any illegally punched data. This has been done by creating computer programs using the Fortran IV language. Each program developed for editing purposes checks the values on the computer tape to assure that they are legitimate values.

For example, when the demographic data of Father's Education was placed on the Hazleton tape in column 128, there were eight legitimate codes tested for by the editing program. The legal codes were:

1 = 1 to 5 years education

2 = 6 to 8 years education

3 = 9 to 11 years education

4 = high school graduate

5 = 13 to 15 years education

6 = college graduate

7 = more than 16 years

9 = not answered

Any other code, 8, 0, $, B, Q, ?, etc., would be noted on a print-out and the proper correction would be made.

These editing procedures are an important part of the data handling procedure. While admittedly time consuming, they are essential in maintaining the reliability and validity of the original collection instruments.

Data Storage

All data following collection and coding must be stored for later analysis. Figure 1 shows the progression of data from its initial collection to its permanent storage on computer tape. The selection of computer tape storage

was on the basis of compactness, low cost and easy access and manipulation of data. As Figure 1 shows, data is transformed from IBM punched card format to magnetic tape. This process is easily reversible and as a consequence, card decks can be generated from tape with any selection of information desired punched on the new deck. Because of this facility, most all project analyses have been computed by using decks of information derived from the tape. This allows several investigators to work independently and concurrently without hindering each other's progress. More importantly the magnetic tape is protected from possible investigator error which could destroy or change the information on tape.

Because such an enormous amount of irreplaceable information is recorded on these tapes at great expense of time and money, the value of the data on tape becomes astronomical. For this reason, every attempt has been made to safeguard against the loss of data. This has been accomplished by the limiting of direct work with the tapes by any one other than thoroughly trained project staff. Also, up-to-date duplicate tapes are maintained as back-up should an equipment or operator failure damage the original tape. In addition, the punched card decks used to place data on tape, have been retained as a further precaution.

Data Tape Layout

The use of computer tape to store data provide convenient and compact storage of data. However, an accurate reference is necessary to enable the researcher to interpret that data. This reference has been termed the Data Tape Layout. The Data Tape Layout for the Vocational Development Study consists of five sections. Section I, the Key Work Index, provides the user with the location of data on tape by means of prime or key word descriptors.

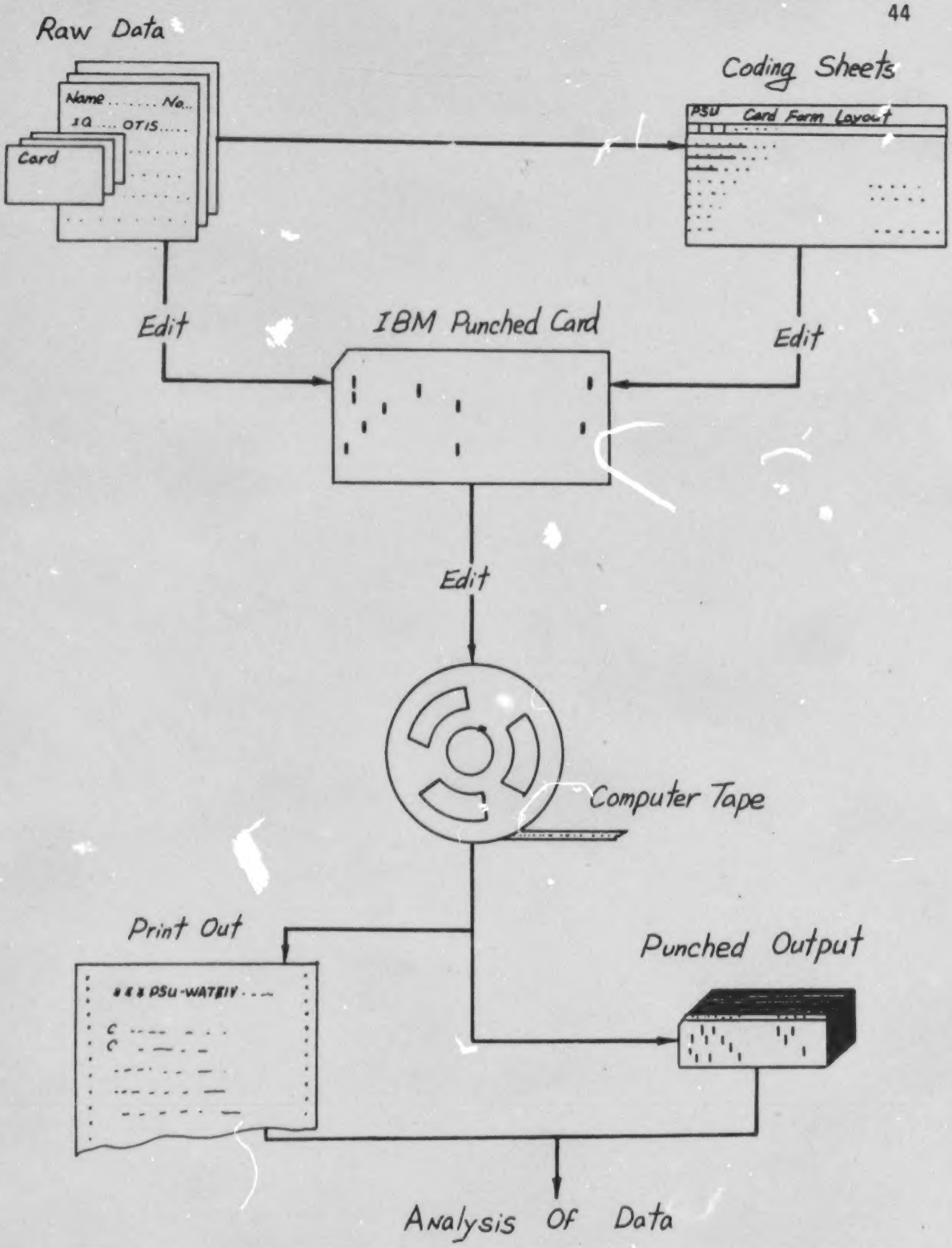

Figure 1 : Data Collection Flow Diagram

Each descriptor is followed by the column location of that piece of data. Also listed is an "A," "H," or "W" which indicates the project sample(s) for which data is present, Altoona, Hazleton, and/or Williamsport.

Section II, III and IV refer respectively to Altoona, Hazleton, and Williamsport. These sections describe the data column by column from column 1 through the last column on each tape. The data contained in each column is named and the codes used are described.

Section V, the Glossary, may be referred to for additional information. In this section are definitions of terms and information concerning test forms, instruments, and other data collecting devices. See Appendix B for actual Tape Layout.

FOLLOW-UP

Procedure

A year after graduation follow-up for both the Hazleton and Williamsport samples of the VDS Project was conducted in the Spring of 1975. The last in-school contact with these students was during their senior year, 1973-74, during which time a two part questionnaire was developed and administered. The first part provided the VDS staff with information helpful in locating individuals after graduation, including current addresses, and parent or guardian addresses. The second part provided information about the student's high school experience, as well as future aspirations.

The student responses to this senior year questionnaire was used to help develop the final mailing list. A four part, two page questionnaire was developed and printed on a Scan Sheet reply form. A sample of this questionnaire is included in Appendix A. Each member of the sample was instructed to complete Part A and the one most appropriate additional part; Part B to be completed by those in school, Part C to be completed by those who were employed, and Part D to be completed by those who were unemployed. Figure 2 contains the flow diagram of the questionnaire mailing strategy.

The packet mailed to the sample included the following:

1. The questionnaire - printed on white paper with light green ink and shading
2. Stamped, addressed return envelope
3. Pencil inscribed - The Pennsylvania State University
4. Cover letter - printed on buff colored paper, fully explaining the follow-up questionnaire - (Appendix A)

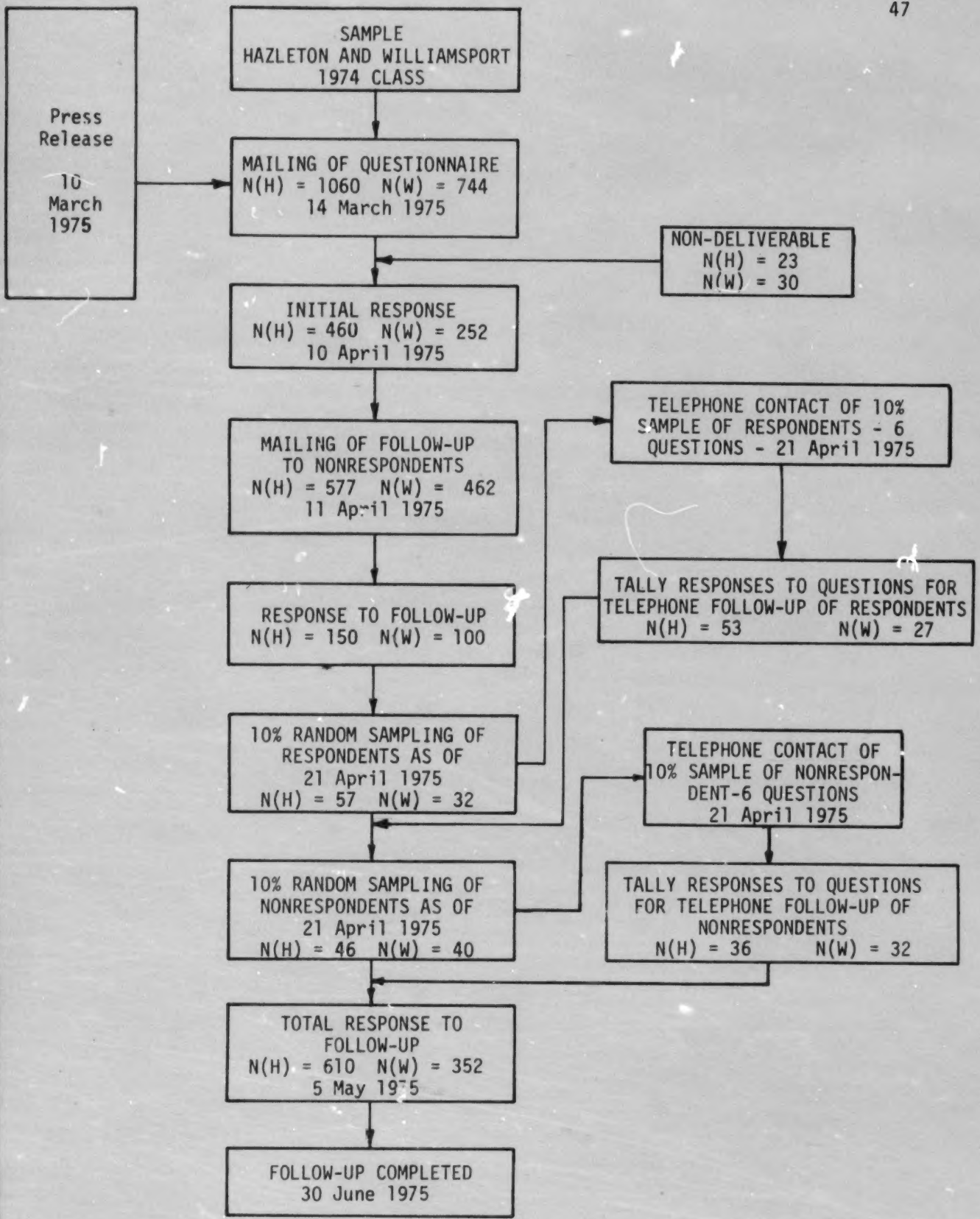
Press Release 10 March 1975
SAMPLE HAZLETON AND WILLIAMSPORT 1974 CLASS
MAILING OF QUESTIONNAIRE N(H) = 1060 N(W) = 744 14 March 1975
NON-DELIVERABLE N(H) = 23 N(W) = 30
INITIAL RESPONSE N(H) = 460 N(W) = 252 10 April 1975
MAILING OF FOLLOW-UP TO NONRESPONDENTS N(H) = 577 N(W) = 462 11 April 1975
TELEPHONE CONTACT OF 10% SAMPLE OF RESPONDENTS - 6 QUESTIONS - 21 April 1975
TALLY RESPONSES TO QUESTIONS FOR TELEPHONE FOLLOW-UP OF RESPONDENTS N(H) = 53 N(W) = 27
RESPONSE TO FOLLOW-UP N(H) = 150 N(W) = 100
10% RANDOM SAMPLING OF RESPONDENTS AS OF 21 April 1975 N(H) = 57 N(W) = 32
TELEPHONE CONTACT OF 10% SAMPLE OF NONRESPONDENT-6 QUESTIONS 21 April 1975
10% RANDOM SAMPLING OF NONRESPONDENTS AS OF 21 April 1975 N(H) = 46 N(W) = 40
TALLY RESPONSES TO QUESTIONS FOR TELEPHONE FOLLOW-UP OF NONRESPONDENTS N(H) = 36 N(W) = 32
TOTAL RESPONSE TO FOLLOW-UP N(H) = 610 N(W) = 352 5 May 1975
FOLLOW-UP COMPLETED 30 June 1975

Figure 2. Flow Diagram of Questionnaire Mailing Strategy

Consideration for the use of colored ink and paper were made with reference to an article describing follow-up research by Pucel, et al., in 1971 concerning responder characteristics.[1]

After a three week period, a second packet was mailed to the non-responders. The second packet contained:

1) A copy of the questionnaire

2) Stamped, addressed return envelope

3) Cover letter - second mailing - A sample is included in (Appendix A)

A pencil was not included in this follow-up packet so as not to reinforce non-responding.

Tables 3 and 4 provide an overview of how the Hazleton and Williamsport samples responded to these two mailings. From Table 3 it can be seen that the number of the initial mailing in the Hazleton sample was 1060. Of this number 23 pieces were returned to the Vocational Development Study as non-deliverable for a variety of reasons. This resulted in 1037 pieces of mail which were delivered. The initial response from the first mailing totaled 460 questionnaires or approximately 45 percent.

The second mailing for the Hazleton sample consisted of 577 pieces, to include all those who had not responded to the initial mailing, minus the non-deliverables. The second mailing resulted in an additional 150 replies. From the two mailings a total of 610 questionnaires were returned, resulting in a overall response rate of 59 percent.

A breakdown of these replies follows; 336 or 55 percent of the subjects were in some sort of post-secondary school. The types of schools varied from technical training institutes to universities, 214 or 36 percent of the subjects were

1. Pucel, D.S., Nelson, H.F., and Wheeler, D.N. Follow-up returns as a function of incentives and responder characteristics. Vocational Guidance Quarterly, March 1971, pp. 19, 3, 188-192.

Table 3. Response to Hazleton Follow-up Questionnaire for Class of 1974.

Action		Number
Initial Mailing		1060
Non-Deliverable		-23
	Sub total	1037
Initial Mailing Response		460
Follow-up Mailing Response		150
	Total returns	610
Telephone Follow-up		
Response of 10% of Responders (21 April 1975) (N=57)		53
Response of 10% of Non-Responders (21 April 1975) (46)		36
Percent of Total Returns (610/1037)		59%
Number of Returns by Questionnaire Part		
Part A - All		610
Part B - In school		336
Part C - Employed		214
Part D - Unemployed		60

Table 4. Response to Williamsport Follow-up Questionnaire for Class of 1974.

Action		Number
Initial Mailing		744
Non-Deliverable		-30
	Sub total	714
Initial Mailing Response		252
Follow-up Mailing Response		100
	Total returns	352
Telephone Follow-up		
Response of 10% of Responders (21 April 1975) (N=32)		27
Response of 10% of Non-Responders (21 April 1975) (N=40)		32
Percent of Total Returns (352/714)		50%
Number of Returns by Questionnaire Part		
Part A - All		352
Part B - In school		154
Part C - Employed		143
Part D - Unemployed		55

working at mostly low level jobs and 60 or 9 percent of the respondents were unemployed.

An examination of Table 4 shows that the initial Hazleton mailing consisted of 744 pieces. Of these, 30 were returned as non-deliverable. This left a total of 714 pieces which were delivered. From this first mailing 252 questionnaires were returned, or approximately 34 percent of those delivered.

The second mailing to the Williamsport sample consisted of 462 pieces, which consisted of those who had not responded to the initial mailing, less the non-deliverables at the time of the mailing. This second mailing netted an additional 100 replies or approximately 23 percent of this mailing. In total, 352 questionnaires were returned, giving approximately a 50 percent return rate.

The subjects responded to different sections of the questionnaire according to their current employment status. A breakdown of these replies follows: 154 or 43 percent of the subjects were attending a post-secondary institution; 143 or 40 percent were working, mostly in low level jobs; and 55 or 17 percent of the subjects were unemployed.

The overall return rates for the Hazleton sample was 59 percent, while that for Williamsport was 50 percent. Both samples were low when compared to the return rate for the Altoona sample of 68 percent, which was conducted a year earlier. One can only speculate on the reasons for this decrease. Perhaps the lack of incentives in the Hazleton and Williamsport follow-up contributed to this lower return rate. The previous Altoona follow-up offered the participants a chance to win a prize--a portable TV or one of several clock radios which were offered--if they filled in and returned the questionnaire by a certain date. The prizes may have added to the number of returns in Altoona. However, even without these incentives

the returns from Hazleton and Williamsport are respectable when compared with other follow-up survey rates, but the case for using incentives to increase the number of returns, seems a strong one.

Telephone Follow-up

Procedure

A telephone follow-up was conducted with approximately 10 percent of both the respondents and non-respondents to the follow-up questionnaire as of 21, April 1975. The follow-up questionnaire consisted of six questions designed to supplement the information gathered on the mail questionnaire for those who responded, and provide data from those who did not. These telephone follow-up questions related to the quality of the individual's counseling which they received in high school. The introductory paragraph of the follow-up questionnaire identified; the caller, the project, the degree of the individual's cooperation to date, and reaffirmed the project's commitment to confidentiality on all information received. Figure 3 presents the telephone follow-up questionnaire.

Sample

The students in the sample had originally been given project ID numbers as they were enrolled in high school, and no attempt was made to assign numbers in any systematic method. As a result a numerical sorting of student cards by ID numbers provided a random listing of the members of each sample. These cards were then renumbered in sequence by hand beginning with number 1. A table of random numbers was then used to select the sample utilizing the sequence numbers. The resulting samples consisted of approximately 10 percent of both the respondents and non-respondents from Hazleton and Williamsport.

Name _____ Respondent _____

Declined to cooperate _____ Non-Respondent _____

VOCATIONAL DEVELOPMENT STUDY SUPPLEMENTAL TELEPHONE QUESTIONS FOR RESPONDERS AND NON-RESPONDERS TO ONE-YEAR AFTER GRADUATION FOLLOW-UP QUESTIONNAIRE

Hello _____ my name is _____. I am working with the Vocational Development Study at The Pennsylvania State University. Recently you received a questionnaire from us which you completed/or did not complete. Now, we would like you to answer six short questions. Once again, let me reassure you that all information you give us will be held in strict confidence. Shall we begin?

1. Did you receive assistance from counselors in your High School or course scheduling? . . . . . YES NO

   If yes, how often? . . . . . _____

   On the average, how many minutes did you spend with your counselor? . . . . . _____

2. Was there a Career Resource Center available for your use while you were in High School? . . . . . YES NO

   If yes, did you use it?. . . . . YES NO

   How often? . . . . . _____

   Did you find what you were looking for?. . . . . YES NO

3. While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning? . . . . . YES NO

   In what grades were these given? . . . . . _____

   Were the results explained to you? . . . . . YES NO

4. Did you receive counseling in High School on career planning?. . . . YES NO

   If yes, how often? . . . . . _____

   On the average, how many minutes did you spend with your counselor? . . . . . _____

5. How would you rate the counseling you received?

   Really helpful . . _____
   Satisfactory . . . _____
   Bad. . . . . _____
   No Comment . . . . _____

6. If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation? . . . . . YES NO

   If not, have you used the State Employment Service?. . . . . YES NO

   Would you use the State Employment Service?. . . . . YES NO

Figure 3. Telephone Follow-up Questionnaire

Table 5 presents the sample size and percentages of the telephone follow-up. This table includes the initial total in the random sample and the actual number of people contacted. These figures are then reported in percentages.

The non-respondent group presented most of the problems during the attempts to contact them. Some of the reasons for these problems with this group were that they were no longer living in area or at home, left no forwarding address, no phone, unlisted number, military service, lost questionnaires, and lastly, disinterest. Generally, phone contact with this group was difficult, and 21 percent of non-respondents could not be contacted. Many of the attempted contacts with this group involved two or more phone calls. Attitudes of the non-respondent ranged from pleasant to sullen with most of them reacting to the questions only as something to finish. It should be pointed out that in no case was any hostility expressed by members of this group. The degree of success of contacting the combined Hazleton and Williamsport non-respondent group was 79 percent.

The respondent telephone follow-up ran much smoother by comparison. One call often was enough and the reactions from this group were more positive than those from the non-respondent group. Contacts with this combined sample were very good and totaled 90 percent. Telephone time spent with this group was about half that spent with the non-respondents, and the total sample contacts made by telephone was 85 percent.

Table 5: Sample Size and Percentages of Respondents and Non-Respondents to the Telephone Follow-up for the Hazleton and Williamsport Samples.

Group	Sample Size		Percent
	Total Sample	Total Contacted	Percent
Hazleton Respondents	57	53	93%
Williamsport Respondents	32	27	84%
Totals	89	80	90%
Hazleton Non-Respondents	46	36	78%
Williamsport Non-Respondents	40	32	80%
Totals	86	68	79%
Hazleton Respondents and Non-Respondents	103	89	86%
Williamsport Respondents and Non-Respondents	72	59	82%
Totals	175	148	85%

RESULTS

Tables 6 through 12 presents the percentage of responses to each item on the questionnaire for the telephone follow-up. In an attempt to better understand this data, a brief description of the response pattern for each of the six questions follows.

Question One

Did you receive assistance from counselors in your High school on course scheduling?

If yes, how often?

On the average, how many minutes did you spend with your counselor?

The range of yes answers to this question was from a high of 93 percent for the Williamsport non-responders to a low of 40 percent for the Hazleton respondents. The Williamsport group showed a more varied response pattern concerning the frequency of visits with the counselor concerning course scheduling, whereas, the Hazleton group, for those who sought this assistance, usually met with their counselors from one to three times per year.

The average time in minutes per year spent with the counselor followed much the same pattern as did the frequency of visits. The Williamsport group displayed a wide range concerning time spent with the counselor while the Hazleton group spent less time and shorter periods per year on course scheduling.

TABLE 6: Percent of Responses to Questionnaire of Telephone Follow-up for Williamsport Respondents. N = 27

QUESTIONS	PERCENT OF RESPONSE
1. Did you receive assistance from counselors in your High School or course scheduling?	YES 89% NO 11%
If yes, how often? times/year 1 30% 2 38% 3 0 4 12% 5 12% 10+ 8%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 12% 10 17% 15 42% 20 8% 30 17% 30+ 4%	
2. Was there a Career Resource Center available for your use while you were in High School?	YES 85% NO 15%
If yes, did you use it?	YES 43% NO 57%
How often? times/year 1 30% 2 30% 3 0 4 20% 5 10% 10+ 10%	
Did you find what you were looking for?	YES 77% NO 23%
3. While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning?	YES 93% NO 7%
In what grades were these given? 9 26% 10 37% 11 10% 12 16% ? 11%	
Were the results explained to you?	YES 77% NO 23%
4. Did you receive counseling in High School on career planning?	YES 59% NO 41%
If yes, how often? times/year 1 25% 2 19% 3 12% 4 19% 5 6% 10+ 19%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 7% 10 15% 15 21% 20 28% 30 29% 30+ 0	
5. How would you rate the counseling you received?	
Really helpful	37%
Satisfactory	52%
Bad	11%
No Comment	0
6. If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation?	YES 59% NO 41%
If not, have you used the State Employment Service?	YES 25% NO 75%
Would you use the State Employment Service?	YES 78% NO 22%

TABLE 7: **Percent of Response to Questionnaire of Telephone Follow-up for Williamsport Non-Respondents. N = 32**

QUESTIONS	PERCENT OF RESPONSE
1. Did you receive assistance from counselors in your High School or course scheduling?	YES 93% NO 7%
If yes, how often? times/year 1 35% 2 46% 3 0 4 4% 5 4% 10+ 11%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 8% 10 19% 15 38% 20 15% 30 15% 30+ 5%	
2. Was there a Career Resource Center available for your use while you were in High School?	YES 92% NO 8%
If yes, did you use it?	YES 56% NO 44%
How often? times/year 1 21% 2 29% 3 7% 4 29% 5 7% 10+ 7%	
Did you find what you were looking for?	YES 86% NO 14%
3. While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning?	YES 77% NO 23%
In what grades were these given? 9 15% 10 20% 11 29% 12 24% ? 12%	
Were the results explained to you?	YES 68% NO 32%
4. Did you receive counseling in High School on career planning?	YES 54% NO 46%
If yes, how often? times/year 1 20% 2 47% 3 7% 4 7% 5 13% 10+ 6%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 7% 10 7% 15 33% 20 6% 30 27% 30+ 20%	
5. How would you rate the counseling you received?	
Really helpful	28%
Satisfactory	58%
Bad	7%
No Comment	7%
6. If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation?	YES 62% NO 38%
If not, have you used the State Employment Service?	YES 10% NO 90%
Would you use the State Employment Service?	YES 80% NO 20%

TABLE 8: Percent of Responses to Questionnaire of Telephone Follow-up for Hazleton Respondents. N = 53

QUESTIONS	PERCENT OF RESPONSE
1. Did you receive assistance from counselors in your High School on course scheduling?	YES 40% NO 60%
If yes, how often? times/year 1 35% 2 20% 3 20% 4 5% 5 0 10+ 20%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 9% 10 23% 15 45% 20 9% 30 0 30+ 14%	
2. Was there a Career Resource Center available for your use while you were in High School?	YES 72% NO 28%
If yes, did you use it?	YES 63% NO 37%
How often? times/year 1 33% 2 29% 3 4% 4 8% 5 13% 10+ 13%	
Did you find what you were looking for?	YES 71% NO 29%
3. While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning?	YES 77% NO 23%
In what grades were these given? 9 23% 10 18% 11 28% 12 23% ? 8%	
Were the results explained to you?	YES 71% NO 29%
4. Did you receive counseling in High School on career planning?	YES 51% NO 49%
If yes, how often? times/year 1 44% 2 22% 3 18% 4 0 5 8% 10+ 8%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 8% 10 12% 15 35% 20 8% 30 15% 30+ 22%	
5. How would you rate the counseling you received?	
Really helpful	13%
Satisfactory	38%
Bad	24%
No Comment	25%
6. If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation?	YES 52% NO 48%
If not, have you used the State Employment Service?	YES 30% NO 70%
Would you use the State Employment Service?	YES 83% NO 17%

TABLE 9: **Percent of Responses to Questionnaire of Telephone Follow-up for Hazleton Non-Respondents. N = 36**

QUESTIONS	PERCENT OF RESPONSE
1. Did you receive assistance from counselors in your High School or course scheduling?	YES 44% NO 66%
If yes, how often? times/year 1 38% 2 44% 3 0 4 0 5 0 10+ 18%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 0 10 9% 15 32% 20 9% 30 23% 30+ 27%	
2. Was there a Career Resource Center available for your use while you were in High School?	YES 77% NO 33%
If yes, did you use it?	YES 50% NO 50%
How often? times/year 1 15% 2 15% 3 15% 4 0 5 23% 10+ 32%	
Did you find what you were looking for?	YES 85% NO 15%
3. While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning?	YES 85% NO 15%
In what grades were these given? 9 31% 10 18% 11 30% 12 16% ? 5%	
Were the results explained to you?	YES 52% NO 48%
4. Did you receive counseling in High School on career planning?	YES 36% NO 64%
If yes, how often? times/year 1 38% 2 46% 3 0 4 0 5 0 10+ 16%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 15% 10 15% 15 25% 20 15% 30 15% 30+ 15%	
5. How would you rate the counseling you received?	
Really helpful	19%
Satisfactory	33%
Bad	22%
No Comment	26%
6. If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation?	YES 41% NO 59%
If not, have you used the State Employment Service?	YES 33% NO 67%
Would you use the State Employment Service?	YES 87% NO 13%

TABLE 10: **Combined Percent of Responses to Questionnaire of Telephone Follow-up for Williamsport Respondents and Non-Respondents. N = 59**

QUESTIONS	PERCENT OF RESPONSE
1. Did you receive assistance from counselors in your High School or course scheduling?	YES 85% NO 15%
If yes, how often? times/year 1 31% 2 41% 3 0 4 8% 5 8% 10+ 12%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 10% 10 18% 15 40% 20 12% 30 16% 30+ 4%	
2. Was there a Career Resource Center available for your use while you were in High School?	YES 85% NO 15%
If yes, did you use it?	YES 50% NO 50%
How often? times/year 1 25% 2 29% 3 4% 4 25% 5 8% 10+ 9%	
Did you find what you were looking for?	YES 82% NO 18%
3. While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning?	YES 85% NO 15%
In what grades were these given? 9 16% 10 22% 11 27% 12 27% ? 8%	
Were the results explained to you?	YES 73% NO 27%
4. Did you receive counseling in High School on career planning?	YES 56% NO 44%
If yes, how often? times/year 1 22% 2 32% 3 10% 4 13% 5 10% 10+ 13%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 7% 10 10% 15 28% 20 17% 30 28% 30+ 10%	
5. How would you rate the counseling you received?	Really helpful 33% Satisfactory 55% Bad 9% No Comment 3%
6. If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation?	YES 60% NO 40%
If not, have you used the State Employment Service?	YES 17% NO 83%
Would you use the State Employment Service?	YES 84% NO 16%

TABLE 11: **Combined Percent of Responses to Questionnaire of Telephone Follow-up for Hazleton Respondents and Non-Respondents. N = 89**

QUESTIONS	PERCENT OF RESPONSE
1. Did you receive assistance from counselors in your High School or course scheduling?	YES 42% NO 58%
If yes, how often? times/year 1 5% 2 16% 3 39% 4 9% 5 11% 10+ 20%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 5% 10 16% 15 39% 20 9% 30 11% 30+ 20%	
2. Was there a Career Resource Center available for your use while you were in High School?	YES 74% NO 26%
If yes, did you use it?	YES 58% NO 42%
How often? times/year 1 27% 2 24% 3 8% 4 5% 5 16% 10+ 20%	
Did you find what you were looking for?	YES 75% NO 25%
3. While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning?	YES 81% NO 19%
In what grades were these given? 9 27% 10 18% 11 28% 12 20% ? 7%	
Were the results explained to you?	YES 45% NO 55%
4. Did you receive counseling in High School on career planning?	YES 45% NO 55%
If yes, how often? times/year 1 42% 2 30% 3 12% 4 0 5 5% 10+ 11%	
On the average, how many minutes did you spend with your counselor? minutes/year 5 10% 10 13% 15 30% 20 10% 30 15% 30+ 22%	
5. How would you rate the counseling you received?	
Really helpful	15%
Satisfactory	36%
Bad	24%
No Comment	25%
6. If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation?	YES 48% NO 52%
If not, have you used the State Employment Service?	YES 32% NO 68%
Would you use the State Employment Service?	YES 85% NO 15%

TABLE 12: **Combined Percent of Responses to Questionnaire of Telephone Follow-up for Williamsport and Hazleton, both Respondents and Non-Respondents. N=148.**

QUESTIONS	PERCENT OF RESPONSE
1. Did you receive assistance from counselors in your High School or course scheduling?	YES 64% NO 36%
If yes, how often? times/year	1 18% 2 28% 3 18% 4 10% 5 10% 10+ 16%
On the average, how many minutes did you spend with your counselor? minutes/year	5 8% 10 17% 15 39% 20 11% 30 13% 30+ 12%
2. Was there a Career Resource Center available for your use while you were in High School?	YES 80% NO 20%
If yes, did you use it?	YES 54% NO 46%
How often? times/year	1 26% 2 26% 3 7% 4 15% 5 12% 10+ 14%
Did you find what you were looking for?	YES 79% NO 21%
3. While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning?	YES 83% NO 17%
In what grades were these given?	9 21% 10 20% 11 28% 12 24% ? 7%
Were the results explained to you?	YES 59% NO 41%
4. Did you receive counseling in High School on career planning?	YES 51% NO 49%
If yes, how often? times/year	1 32% 2 31% 3 11% 4 6% 5 8% 10+ 12%
On the average, how many minutes did you spend with your counselor? minutes/year	5 8% 10 12% 15 29% 20 14% 30 21% 30+ 16%
5. How would you rate the counseling you received?	Really helpful 24% Satisfactory 45% Bad 17% No Comment 14%
6. If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation?	YES 54% NO 46%
If not, have you used the State Employment Service?	YES 24% NO 76%
Would you use the State Employment Service?	YES 85% NO 15%

Question Two

Was there a Career Resource Center available for your use while you were in High School?

If yes, did you use it?

How often?

Did you find what you were looking for?

The yes response to the first part of this question ranged from a high of 92 percent for the Williamsport non-respondents to a low of 72 percent for the Hazleton respondents. Since the response pattern was somewhat varied for this question an attempt was made to better understand this varied rate. A telephone call was placed to the counseling offices at both high schools in an attempt to find out what type of Area Resource Center was available. It was felt that a possible explanation for the difference in these figures could be the result of the actual facilities available to the students and how they preceived them. It was learned that Williamsport has a brand new school with a very specific area designated as the Career Resource Center. Hazleton has much of the same material available, but rather than being located in a specific area designated as a "career center" it is spread out in the individual counselors' offices and the students' waiting area. Despite the better facilities for career information at Williamsport only 50 percent of that sample used them, while 58 percent of the Hazleton sample sought career information under more trying conditions. For the total sample (Table 12) of all students who used career information facilities at either school, 79 percent answered "Yes" when asked if they had found material they were looking for.

Question Three

While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning?

In what grades were these given?

Were the results explained to you?

The range of yes responses varied from a high of 93 percent for the Williamsport respondents to a low of 77 percent for both the Hazleton respondents and the Williamsport non-respondents. When asked in what grades these tests and inventories were given all samples seemed to respond in much the same way. That is, there did not seem to be any one grade in which these tests and inventories were given more often than any other.

When asked if the results of these tests and inventories were explained to them, the range of yes responses varied from a high of 77 percent for the Williamsport respondents to a low of 52 percent for the Hazleton non-respondents.

Thus it seems that tests and inventories are given to all students in all grades, but more from the Williamsport group seem to receive information concerning the results of these tests and inventories.

Question Four

Did you receive counseling in High School on career planning?

If yes, how often.

On the average, how many minutes did you spend with your counselor?

The yes response to the question whether or not they received career counseling in High School ranged from a high of 59 percent for the

Williamsport respondents to a low of 36 percent for the Hazleton non-respondents. This indicates that less than one half of the students received any type of career counseling from either group. Those answering yes to this question were then asked how often they received this type of counseling. The largest portion of all four groups seemed to indicate that the frequency for this type of counselor contact was between one and three times a year. When asked to estimate the number of minutes spent per year on these sessions about one half of all groups reported a time range of between 5 and 15 minutes.

Question Five

How would you rate the counseling you received?

Really Helpful
Satisfactory
Bad
No Comment

When those contacted by telephone were asked to rate the counseling they received about 88 percent of the Williamsport group responded to the "Really Helpful and Satisfactory" rating whereas, the response from the Hazleton group was 51 percent for these two classifications using the combined response rate from both groups, as reported in Tables 10 and 11. About 24 percent of the Hazleton group replied to the "Bad" catagory compared to about 9 percent of those in the Williamsport group. The "No Comment" catagory received about 25 percent of the responses from the Hazleton group compared to 3 percent for the Williamsport sample.

The response pattern to this question seems to indicate that the Williamsport group possessed positive feelings toward their counseling while those in the Hazleton group did not express this positive attitude.

Question Six

If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation?

If not, have you used the State Employment service?

Would you use the State Employment Service?

An inspection of Tables 6, 7, 8, and 9 reveal a similar pattern for the response rate to the three parts of this question. Therefore, the results will be presented using the combined respondents and non-respondents Tables numbers, 10 and 11. From Tables 10 and 11 it can be seen that about one half of each group would return to the high school and use counseling facilities if they were made available to them. With regard to using the State Employment services about three fourths of each group stated that they have not used the State Employment office for any of its varied services.

When asked if they would use the State Employment Service to improve their present position about 85 percent of both groups said that they would. Thus, indicating that the need has not yet presented itself but if it should they would use the services offered by the State Employment Service.

III

RESEARCH STUDIES CONDUCTED AND DISSEMINATION

Introduction

The largest contribution to the field of educational research, and in particular, research concerned with the vocational development process made available through the combined efforts of this research program, is reported in the twenty-two monographs published by the Vocational Development Study.

Although this project is a separately funded research effort, it is part of the ten year longitudinal Vocational Development Study Project. Since the total VDS project is to cover a span of ten years it must be conducted in a series of phases. Monographs one through twenty were produced under Phases I, II, and III and were reported in the final report of that part of the project.

The research necessary for monographs number 21 and 22 is being conducted as a part of Phase IV of the VDS Project, and will be available from the VDS Project office, ERIC, and VEIN upon completion.

A list of all twenty two monographs is included in this section so that the reader may examine this list and better understand the scope of the research conducted in conjunction with this research program. Monograph Number One is a description of the research program and is provided to those wanting a capsule view of this ten year research endeavor. Limited copies of the monographs of this series are available upon request from the Department of Vocational Education at The Pennsylvania State University, VEIN, and the ERIC Clearinghouse.

This section also contains all papers presented at conventions (Appendix C), a list of all published articles, and other related written material such as Masters Papers resulting from Phase IV.

Since good community relations is one important ingredient toward the success of a program of this type, an attempt was made to promote favorable community understanding concerning this project through news releases to local newspapers. In addition, the students who were to receive the one-year after graduation follow-up questionnaire were out of school for close to a year and this served as a reminder of the VDS project to these students. Examples of newspaper items are presented in this section.

The primary objective of Phase IV of the VDS Project was to conduct a one-year after graduation follow-up survey of both the Hazleton and Williamsport samples. A complete questionnaire packet used with this follow-up survey along with all other data collection instruments is included in (Appendix A), of this report.

A descriptive report -- curriculum, sex and percentage of total by response -- of all return data from this survey for both the Hazleton and Williamsport school districts is included in Appendix D.

It is the intent of this section to report all written information concerned directly or indirectly with this research effort. It is through this written information that the reader is provided with the conceptual scope of this project and the results of this research program.

Vocational Development Study Series

Impellitteri, Joseph T. and Kapes, Jerome T. A Longitudinal Study of Vocational Development: Implications for Vocational Education and Guidance. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 1, July, 1971, (42 pp.).

Kapes, Jerome T. The Relationship Between Selected Characteristics of Ninth Grade Boys and Curriculum Selection and Success in Tenth Grade. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 2, August, 1971, (141 pp.).

Impellitteri, Joseph T. and Kapes, Jerome T. The Measurement of Occupational Values. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 3, September, 1971, (64 pp.).

Enderlein, Thomas E. An Examination of the Relationship of Selected Student Variables to Vocational-Technical Shop Achievement. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 4, February, 1972, (70 pp.).

Kapes, Jerome T. and Lotowycz, Leo W. Changes in the Occupational Values of Students Between Ninth and Tenth Grade as Related to Course of Study and Other Student Characteristics. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 5, April, 1972, (48 pp.).

O'Reilly, Patrick A. Evaluation of In-School Success Criteria for Vocational-Technical Students. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 6, May, 1972, (71 pp.).

Brantner, Seymour T. and Enderlein, Thomas E. A Comparison of Vocational and Non-Vocational High School Dropouts and Retainers. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 7, June, 1972, (69 pp.).

Martin, Randall B. Relationships Between Holland's Vocational Preference Inventory and Vocational-Technical Student Achievement. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 8, October, 1972, (64 pp.).

McAlister, Bernard M. Curriculum Selection and Success of Tenth Grade Girls as Related to Selected Ninth Grade Characteristics. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 9, March, 1973, (101 pp.).

Hill, Theodore A., Kapes, Jerome T., Martin, Randall B. The Ninth Grade Characteristics of Students Entering Different Tenth Grade Curricula: VDS Altoona Sample. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 10, April, 1973, (115 pp.).

Kapes, Jerome T., Hill, Theodore A., Martin, Randall B. The Ninth Grade Characteristics of Students Entering Different Tenth Grade Curricula: VDS Hazleton Sample. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 11, April, 1973, (178 pp.).

Martin, Randall B., Hill, Theodore A., Kapes, Jerome T. The Ninth Grade Characteristics of Students Entering Different Tenth Grade Curricula: VDS Williamsport Sample. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 12, April, 1973, (138 pp.).

O'Reilly, Patrick A. Predicting the Stability of Expressed Occupational Choices of Secondary Students. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 13, May, 1973, (168 pp.).

Strickler, Robert E. Change in Selected Characteristics of Students Between Ninth and Twelfth Grade as Related to High School Curriculum. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 14, June 1973, (90 pp.).

Brown, Richard H., Kapes, Jerome T. A Longitudinal Study of the Level of Occupational Aspirations of Youth Over the High School Years. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 15, October, 1973, (57 pp.).

Schowalter, Lynn M. The Relationship of High School Curriculum and Other In-School Characteristics to Employment Success One Year After Graduation. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 16, March, 1974 (64 pp.).

Kapes, Jerome T., Pawlowski, Vladimir. Characteristics of Vocational-Technical Instructors and Their Relationship to Student Shop Achievement. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 17, April, 1974, (57 pp.).

McQuay, Paul L. Shop Achievement As An Outcome of One Year Versus Two Years of AVTS Instruction. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 18, May, 1974, (53 pp.).

Kapes, Jerome T., Rollins, Robert D. The Ninth Grade Characteristics of Students Enrolled in Selected AVTS Programs in Twelfth Grade. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 19, June, 1974, (95 pp.).

Enderlein, Thomas E. Causal Relationships of Student Characteristics Related to Satisfaction in Post High School Employment. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 20, July, 1974, (145 pp.).

Martin, Randall B. Predicting Curriculum Satisfaction for High School Students. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 21, (In Progress).

Herr, Edwin L., Enderlein, Thomas E., and Martin, Randall B. Comparisons of Success and Satisfaction Variables for High School Graduates From Three Non-metropolitan School Districts. University Park, Pennsylvania. Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 22, (In Progress).

Publications

A. Papers presented at professional meetings

Kapes, J.T. "Path Analysis and Vocational Education Research: An Overview. American Vocational Association Convention, New Orleans, December 7, 1974.

Enderlein, T.E. "Path Analysis: A Program Evaluation Example." American Vocational Association Convention, New Orleans, December 7, 1974.

Herr, E.L. "Path Analysis and Vocational Development Research." American Vocational Association Convention, New Orleans, December 7, 1974.

O'Reilly, P.A. "Path Analysis: An Investigation of Stability of Expressed Occupational Choice." American Vocational Association Convention, New Orleans, December 7, 1974.

B. Articles Based on Project Data

Enderlein, Thomas E. "Causal Patterns Related to Post High School Employment." Journal of Vocational Behavior (in press).

Herr, E.L. and Enderlein, T.E. "Vocational Maturity: The Effects of School, Grade, Curriculum and Sex." (submitted).

C. Other Related Papers

Miller, D. "Ninth Grade Profiles of Students who Completed the Business Education Curriculum at Altoona High School" Masters Paper. (In Progress).

Harcourt Brace Jovanovich, Inc., Test Department, "OVIS Two-Year Stability Study: Grade 9 - Grade 11 (Pennsylvania Sample) Ohio Vocational Interest Survey, Special Report Series, Report No. 4, November 1974.

D. Monographs

Martin, Randall B. Predicting Curriculum Satisfaction for High School Students. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 21, (In Progress).

Herr, Edwin, L., Enderlein, Thomas E., and Martin, Randall, B. Comparisons of Success and Satisfaction Variables for High School Graduates From Three Non-metropolitan School Districts. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 22, (In Progress).

Dissemination of Project Publications

The project reports have received wide distribution throughout the country. The mailing list for each report consists of approximately 350 names. Copies of the reports are distributed approximately as follows:

- 10 - Pennsylvania Research Coordinating Unit
- 20 - Participating school system
- 20 - Bureau of Vocational, Technical and Continuing Education personnel
- 42 - State RCU directors
- 36 - Penn State Campus
- 30 - Department of Vocational Education, Pennsylvania State University
- 105 - Area Vocational Technical School Directors in Pennsylvania
- 85 - State and National Vocational Education and Vocational Guidance leaders

Additional copies of the reports are disseminated upon request. Table 13 shows the requests honored through the VDS project office as well as the requests coming through VEIN. Availability of the reports has appeared in several guidance and vocational education publications.

Table 13: Monograph Requests

Monograph Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Direct Requests	105	98	185	16	16	12	101	11	50	7	35	5	121	62	74	3	2	2	2	9
VEIN Requests	155	a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	a
Regular Dissemination	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350

NOTE: a. VEIN acknowledged requests for other monographs but a count of these requests was not available

Publicity

It was the intent of the Vocational Development Study (VDS) staff to maintain a cooperative, mutually beneficial relationship with each of the three participating school districts as well as the local communities.

At various times the VDS Project was discussed and its intent explained to members of the news media, to assure a more complete understanding of the intent and purposes of this study. Prior to the mailing of the one year after graduation follow-up questionnaire, a news release explaining the intent of the follow-up was mailed to the local newspapers of both the Hazleton and Williamsport school districts for publication.

The following are copies of newspaper items describing the VDS Project follow-up, which were printed in the local newspapers. It must be noted that the VDS Project staff was unable to obtain the newspaper clipping from the Hazleton area. Therefore, a copy of the news release sent to the Hazleton newspaper is included.

...l. March 16, 1975 GRIT City News Section p.35.

SCHOOLS AND COLLEGES

QUESTIONNAIRES: The Vocational Development Study Project at the Pennsylvania State University will mail questionnaires this week to the 1974 graduates of Williamsport High School. The career project is an ongoing program that began with the students in their freshmen year and will continue for several years after graduation. The purpose of the follow-up questionnaire is to determine if there are effective means of predicting the occupational success of students prior to and during their high school years in order to provide more effezive counseling to future students. The cooperation of those persons receiving questionnaires will enable the project to be successful, said a university spokesman.

Williamsport Sun-Gazette, Monday, March 17, 1975 5)

'74 WHS Graduates to Receive Study Project Questionnaires

Vocational Development Study Project questionnaires are being mailed this week by the Pennsylvania State University's Department of Vocational Education to 1974 graduates of Williamsport High School.

The project is an ongoing study which began when the class was in its ninth grade school year and will continue for several years after graduation.

According to the university, the primary aim of the study is to determine if there are effective means of predicting occupational success of students prior to and during their high school years. This knowledge could provide more effective counseling to future students, the university says.

NEWS RELEASE

PENN STATE CAREER STUDY QUESTIONNAIRES MAILED

The Vocational Development Study Project at The Pennsylvania State University mailed questionnaires to the 1974 graduates of Hazleton High School this week. The VDS career project is an ongoing program which began with the class in their 9th grade school year and will continue for several years after graduation.

The Class of 1974 completed various test instruments while in grades 9 to 12. They are now going to be asked to complete a follow-up questionnaire their first year after graduation.

The purposes of the career study are many, but the primary aim is to determine if there are effective means of predicting occupational success of students prior to and during their high school years in order to provide more effective counseling to future students.

The cooperation of those receiving questionnaires will enable the Vocational Development Study Staff to continue to gather information and ensure success of this long term study.

IV

Discussion, Conclusions, Contributions

Perhaps the overriding issue in discussing the current study is the complexity of following up participants in a longitudinal study. At best, it is exceedingly difficult and requires a great deal of planning and persistence. While less than 1 percent of the questionnaires mailed were non-deliverable because of unknown address changes, the total response rate, including a second mailing and a telephone follow-up of 10 percent of the responders and non-responders, achieved 59 percent of the Hazleton sample and 50 percent of the Williamsport. It is tempting to say "Is that all?" However, such figures are higher than traditional results from follow-up using parallel formats. Compared to previous VDS follow-ups for which incentives for respondents were used, the current rates are certainly respectable but would have been enhanced had the incentive procedure been used again.

A second issue is what has happened to the students in the sample after high school graduation? Approximately 55 percent (n = 336) of the subjects in Hazleton and 43 percent (n = 154) of the Williamsport sample were in some type of post-secondary education. These institutions included a range of types from short-term technical institutes to colleges and universities, yielding certificates, diplomas, or degrees. Some 36 percent of the Hazleton sample (n = 314) and 40 percent (n = 143) in the Williamsport sample were at work primarily at entry level jobs. And, about 9 percent (n = 60) Hazleton sample and 17 percent (n = 55) of the Williamsport sample were unemployed.

Several observations seem in order here. First, it seems apparent that the students in this sample continue the national trend toward post-secondary education. It is apparent that the students represented here were not

simply "going to college" but had selected many institutions which were primarily advanced occupational or technical preparation in specialized areas rather than general or pre-professional education. Second, the fact that those students who have gone directly into the labor market are primarily in entry level positions must be cast against the realization that these persons were less than one year out of high school when they responded to the survey. In all likelihood, this is too early, particularly in a tightly compacted occupational structure, to begin to note significant occupational advancement patterns. Finally, a 9 percent unemployment rate in the Hazleton population while consistent with the national average is less than one might expect for an adolescent or teen-age working population. This group has for the last decade been experiencing unemployment rates higher than the national average and approximating 15 or more percent on an annual basis. In that sense the unemployment rate in the Williamsport samples is more congruent with the national pattern. The primary differences in the employment rates between Hazleton and Williamsport were not really the focus of this study but further research into this phenomenon would be useful.

A third issue is the perspectives held by the telephone sample of respondents and non-respondents to the availability of counseling services in their respective secondary schools. While counselors were available in all secondary schools attended by sample students, between 70 and 80 percent of the students indicated that they had 3 or less meetings with a counselor per year. On the average, 30 percent of the sample indicated that they spent 10 minutes or less per year on course planning with a counselor. Seventy-five to eighty percent of the students indicated that these typical meetings on either course or career planning with a counselor was less than 30 minutes. Even though career resource centers were available in all the

sample schools, 8 to 33 percent of the students did not know about it and 37 to 57 percent of the students did not use it. Forty-one to sixty-four percent of the students indicated that they received no counseling in high school on career planning. Overall, about 87 percent of the Williamsport respondent/non-respondent sample indicated that their counseling was satisfactory or really helpful. In comparison, only 51 percent of the Hazleton respondent/non-respondent sample is so indicated. About 17 percent of the sample have used the State Employment Service since high school graduation and 84 percent would do so if an occasion arose which made that appropriate.

In general, the perspectives on counseling services available suggest a lack of time and energy devoted to either career or educational planning. What is not know is the amount of time counselors devote to other types of counseling or the case loads they serve. Thus, for whatever reason, students leave high school with minimum guidance about their next steps.

Project Contributions: An Overview

In furtherance of previously stated project goals, to develop professional vocational education research personnel, this project supported two half-time graduate assistants through direct employment with the project. The project further provided aid and consultation to graduate assistants and graduate students in the Department of Vocational Education who had the opportunity to come into contact with the project.

While not a directly stated goal of this research, the project has aided several of the students individually from the Hazleton and Williamsport schools. This aid was felt by the staff more than it was measured. However, comments by students which were enclosed with their returned questionnaires indicated an increased vocational awareness due to the involvement they had with the project. Another of the roles that the project provided was a kind of "outside the system" counselor. Though the project contacts were generally formal, individual contacts of a person to person nature were occasionally made during the collection of data in previous years, and the telephone follow-up this year. These contacts provided the students with a listener. These contacts also revealed the interest of many of the students, that the VDS project would be able to improve conditions and awarenesses of future students.

It is felt that this year's project has continued to provide valuable basic research in the area of vocational development. Much of this effort is evidenced in the soon to be published monograph number 21. The direction of this effort has been in the affective domain of the student-school relationship. The research reported in monograph 21 deals with the in-school satisfaction of high school students. Investigated are the levels of

satisfaction of students with respect to their curriculum and how this satisfaction is related to vocational or other curriculum enrollment. Very few vocational researchers are presently conducting this or similar types of basic research. It is believed that the combination of basic and applied research as conducted by the VDS study will make a lasting contribution which will be evaluated in the future by other researchers.

The collection of one-year follow-up information for the Hazleton and Williamsport samples was the major intent of Phase IV of the VDS project. Completion of this phase completes the data bank for the project until such time as a four year after graduation follow-up is initiated. Completing the data collection for the Hazleton and Williamsport samples fulfills the originally designed model in that, two additional schools are added to the data bank along with the Altoona sample. The importance of this additional data is the replicative nature of the research design, incorporated in the study which greatly increases the validity of the findings and enlarges the scope of these findings to a state-wide, or national basis.

The following is a description of the approximate total bits of information collected to date and stored in the Vocational Development Study Projects' data bank.

VDS DATA BANK

School	Sample Size	Length of Record	Total Bits Per School
Altoona	N ≒ 1200	1030	1.236,000
Hazleton	N ≒ 1000	1134	1,134,000
Williamsport	N ≒ 900	1008	907,200
		TOTAL ≒	3,277,200

The VDS project has provided information to the Hazleton and Williamsport school systems concerning their 1974 graduates. It is the hope and expectation of the project staff that the questionnaire developed and used for this project might be used again in whole or in part for future follow-up efforts by these school systems. The development and testing of this questionnaire are felt to be lasting contributions which any school system might benefit from as they seek to develop their own student follow-up system.

During Phase IV, the VDS project has maintained interest in providing continued consultative support for the three school systems. This was done through telephone contact and dissemination of project information during the course of the year. The project staff and the schools envolved have each benefited from the cross-fertilization of knowledge and information.

The VDS project has maintained its national visibility through the presentation of papers at conventions, journal articles, sharing of data for special reports with a test publisher, monographs and the honoring of numerous requests for monographs in the VDS monograph series, which numbers 22. A result of the research conducted by members of the project has resulted in their utilization by other projects throughout the country as consultants.

The conclusion of Phase IV of the VDS Project represents an important point in this ten year research effort in that data now exists for all three school systems in the sample up to and including one-year after graduation from high school follow-up data.

It is from this point that more comprehensive studies and analyses might be made with this huge amount of data in an attempt to better understand the vocational development process as it relates to the educational process of high school students.

APPENDICES

APPENDIX A

Appendix A contains the instruments used to conduct the one-year follow-up for the Hazleton and Williamsport samples. In appendix A are (1) the two cover letters included in the packet sent to students, (2) the questionnaire itself, and (3) the response sheet and associated table for the telephone survey conducted after the questionnaires were returned.

Vocational Development Study
Department of Vocational Education
Pennsylvania State University

March 14, 1975

Greetings from the VDS Staff:

When you and your fellow classmates were in the ninth grade, the Department of Vocational Education at Penn State asked you to cooperate in a ten year study. Perhaps you remember meeting with us in ninth grade and then again in tenth and twelfth grades. At these meetings you were asked to take several tests, and answer a number of questions about your future occupational and educational plans.

Now that you are out of high school, we want to find out what you are doing. With the information you send us this time and the information you previously gave us, we will be able to discover many important things about your high school experience. These results will help the Vocational Development Project to provide your school and schools throughout the state with information they can use in making changes in their programs.

In conducting this study, we are cooperating with your school district and the State Department of Education in Harrisburg. We can assure you that all of the information you give us is strictly confidential. It will be used on a group basis to describe your class. We are sure you can imagine how difficult and costly it is to conduct a ten year study. You can also understand how important it is that we get complete and accurate information from everyone.

Before filling out the questionnaire, please read the following instructions. The entire questionnaire should take about 15 minutes to fill out.

1. The questionnaire is made up of Parts A, B, C and D. Everyone should fill out Part A. Begin by filling in your name and social security number. Answer all questions in the numbered order which they appear.

2. Use only a No. 2 pencil; one is provided for your convenience. If you decide to change an answer, be sure to erase completely.

3. After completing Part A, fill out only one of the remaining three Parts according to the directions at the end of Part A. You may have some difficulty deciding which Part to fill out, but use your best judgment. If you are working and going to school, decide which of the two you consider to be your full-time activity. If you are a housewife or in the military, fill out the Part you feel applies to you. Whichever Part you choose, be sure to fill it out completely. Remember, of Parts B, C and D, fill out only one Part.

4. For those filling out Part C, be sure to complete the second side beginning with question number 11. (Do not confuse it with Part D which also appears on that side.)

5. When you have completed the questionnaire, fold it and return both pages in the stamped envelope addressed to the VDS Project.

6. If you have any additional comments you wish to make, you can include them on a separate sheet of paper.

7. If you would like any further information about the project you can call us collect at (814) 865-2597 or visit us here at Penn State in Room 247 Chambers Building.

Thank you for your cooperation throughout these many years.

Sincerely,

Edwin L. Herr

Edwin L. Herr
Project Director

Vocational Development Study
Department of Vocational Education
Pennsylvania State University

April 11, 1975

Greetings again:

Approximately three weeks ago, the Vocational Development Study staff sent you a packet of materials including a questionnaire. Since we have not received your response to our first request we are sending you a second one.

Although many of your high school classmates have already returned their questionnaire, it is still very important that we hear from you. In this way we can be sure that we have obtained correct information on the entire group.

If you have already sent in your questionnaire, please disregard this second request. Thank you again for your cooperation.

Sincerely,

Edwin L. Herr

Edwin L. Herr
Project Director

PAGES 103 THROUGH 106

CONTAINING THE

VOCATIONAL DEVELOPMENT STUDY QUESTIONNAIRE

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TABLE :

QUESTIONS	PERCENT OF RESPONSE
1. Did you receive assistance from counselors in your High School or course scheduling?	YES ____ NO ____
If yes, how often? times/year 1 ____ 2____ 3____ 4____ 5____ 10+____	
On the average, how many minutes did you spend with your counselor? minutes/year 5____ 10____ 15____ 20____ 30____ 30+____	
2. Was there a Career Resource Center available for your use while you were in High School?	YES ____ NO ____
If yes, did you use it?	YES ____ NO ____
How often? times/year 1____ 2____ 3____ 4____ 5____ 10+____	
Did you find what you were looking for?	YES ____ NO ____
3. While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning?	YES ____ NO ____
In what grades were these given? 9____ 10____ 11____ 12____ ?____	
Were the results explained to you?	YES ____ NO ____
4. Did you receive counseling in High School on career planning?	YES ____ NO ____
If yes, how often? times/year 1____ 2____ 3____ 4____ 5____ 10+____	
On the average, how many minutes did you spend with your counselor? minutes/year 5____ 10____ 15____ 20____ 30____ 30+____	
5. How would you rate the counseling you received?	
Really helpful . . . . ____	
Satisfactory . . . . . ____	
Bad . . . . . ____	
No Comment . . . . . ____	
6. If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation?	YES ____ NO ____
If not, have you used the State Employment Service?	YES ____ NO ____
Would you use the State Employment Service?	YES ____ NO ____

Name _____ Respondent _____

Declined to cooperate _____ Non-Respondent _____

VOCATIONAL DEVELOPMENT STUDY SUPPLEMENTAL TELEPHONE QUESTIONS FOR RESPONDERS AND NON-RESPONDERS TO ONE-YEAR AFTER GRADUATION FOLLOW-UP QUESTIONNAIRE

Hello _____ my name is _____. I am working with the Vocational Development Study at The Pennsylvania State University. Recently you received a questionnaire from us which you completed/or did not complete. Now, we would like you to answer six short questions. Once again, let me reassure you that all information you give us will be held in strict confidence. Shall we begin?

1. Did you receive assistance from counselors in your High School or course scheduling? . . . . . YES NO

   If yes, how often? . . . . . _____

   On the average, how many minutes did you spend with your counselor? . . . . . _____

2. Was there a Career Resource Center available for your use while you were in High School? . . . . . YES NO

   If yes, did you use it?. . . . . YES NO

   How often? . . . . . _____

   Did you find what you were looking for?. . . . . YES NO

3. While you were in High School did you have the opportunity to take various tests and inventories which would be of help to you in your career planning? . . . . . YES NO

   In what grades were these given? . . . . . _____

   Were the results explained to you? . . . . . YES NO

4. Did you receive counseling in High School on career planning?. . . . YES NO

   If yes, how often? . . . . . _____

   On the average, how many minutes did you spend with your counselor? . . . . . _____

5. How would you rate the counseling you received?

   Really helpful . . _____
   Satisfactory . . . _____
   Bad. . . . . _____
   No Comment . . . . _____

6. If given the opportunity now, would you seek career or vocational counseling from the High School counseling office to improve your present situation? . . . . . YES NO

   If not, have you used the State Employment Service?. . . . . YES NO

   Would you use the State Employment Service?. . . . . YES NO

APPENDIX B

Appendix B contains the magnetic data tape and the data tape layout. Since it is impractical to include a copy of the contents of Appendix B with each copy of this report, one copy was furnished to the sponsoring agency and is on file with, The Director, The Research Coordinating Unit, Pennsylvania Department of Education, Box 911, Harrisburg, Pennsylvania 17126.

APPENDIX C

Appendix C contains copies of convention papers written as a result of the involvement of the authors with the VDS project. Since Appendix C is lengthy, one complete copy is furnished to the sponsoring agency, and is on file with: The Director, The Research Coordinating Unit, The Pennsylvania Department of Education, Box 911, Harrisburg, Pennsylvania 17126.

The following is a list of titles of the papers contained in Appendix C.

1. Kapes, J.T. "Path Analysis and Vocational Education Research: An Overview. American Vocational Association Convention, New Orleans, December 7, 1974.

2. Enderlein, T.E. "Path Analysis: A Program Evaluation Example." American Vocational Association Convention, New Orleans, December 7, 1974.

3. Herr, E.L. "Path Analysis and Vocational Development Research." American Vocational Association Convention, New Orleans, December 7, 1974.

4. O'Reilly, P.A. "Path Analysis: An Investigation of Stability of Expressed Occupational Choice." American Vocational Association Convention, New Orleans, December 7, 1974.

5. Harcourt Brace Jovanovich, Inc., Test Department, "OVIS Two-Year Stability Study: Grade 9 - Grade 11 (Pennsylvania Sample) Ohio Vocational Interest Survey, Special Report Series, Report No. 4, November 1974.

PATH ANALYSIS AND VOCATIONAL EDUCATION RESEARCH: AN OVERVIEW *

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Presented at the Annual Meeting of the
American Vocational Association
New Orleans, Louisiana
December 7, 1974

* This paper is one of four papers presented in a symposium entitled Path Analysis: Applications to Research in Vocational Education. Much of the research reported in the symposium was supported by Pennsylvania's Research Coordinating Unit (RCU) in Vocational Education.

Introduction

This paper is one of four presentations delivered in a symposium format which is designed to introduce vocational educators to the research technique of Path Analysis. Historically, Path Analysis (PA) is not a new methodology having been developed by Sewall Wright (1921) as a research tool in the field of genetics. However, due to the mathematical complexity of the calculations necessary to provide all of the input data for path analysis, it was not widely utilized until the computer became easily accessable. The basic statistical methodology underlying PA is that of linear Multiple Regression Analysis (MRA). The PA application of MRA as a social science research tool using longitudinal data was pioneered mainly by Economist and Sociologist during the last decade.

The adaptation of the PA technique to vocational education and vocational development research appears to be particularly appropriate at this time for two purposes: (1) To evaluate the effectiveness of today's curricula as various career education approaches are being tried; (2) To investigate our theories of vocational development upon which many of our educational decisions need to be based. These two purposes are intrinsically tied to one another; however, it is useful to separate them for purposes of educational research. The first approach is basically one of program evaluation, while the second focuses on the examination of adolescent educational and vocational behavior. The evaluation

application of PA can be traced to the works of Kaufman et al. (1967) and Moss (1968) as they applied MRA to the evaluation of vocational education programs. The vocational development application of PA can be traced to the suggestions of Super (1969) in an article which discussed the future of vocational development research.

The applications of PA described in this symposium are products of research carried out as part of the longitudinal Vocational Development Study (VDS) project (Impellitteri and Kapes, 1971) currently underway in the Department of Vocational Education at the Pennsylvania State University and supported by Pennsylvania's Research Coordinating Unit (RCU) in Vocational Education. Studies by Enderlein (1974) and O'Reilly (1973) applying PA to program evaluation and vocational development problems are described separately as a part of this symposium. The purpose of this presentation is to introduce PA by providing a brief overview of the topic including definitions of terminology unique to PA, a simplified description and model showing how PA operates, and its key benefits to vocational education researchers.

Definition of Terms

Direct Effect: The amount of deviation in the dependent variable which is directly attributable to fluctuation in the independent variable. The direct effect is equal to the standarized path coeficent or Beta weight.

Endogenous Variables: The variables to be explained by the theory under consideration (Blalock, 1968). Variables that have antecedent variables.

Exogenous Variables: "Variables which are assumed to be predetermined, the total variation of which is assumed to be caused by variables outside the set under consideration" (Land, 1971, p.6).

Indirect Effect: The amount of variability in the dependent variable which is attributable to fluctuation in one independent variable causing fluctuation in a related independent variable (Land, 1971).

Intervening Variable: "A variable which tempers or modifies the effect of one variable on another" (O'Reilly, 1973, p. 14).

Recursive Model: One in which all exogenous variables are determined by previous variables in the model and the flow is in one direction with no reciprocal links.

Residual Variables: "A variable assumed to be uncorrelated with the set of variables immediately determining the variable under consideration and to have a mean value of zero, is introduced to account for the variance of the endogenous variable not explained by measured variables" (Land, 1971, p. 6).

Spurious Effect: That part of the association between two variables for which a direct effect is calculated which is due to antecedent variables in the model not causually involved. (Charner and Cohen, 1973).

Standarized Path Coefficient: The mathematical value which "Measured the fraction of the standard deviation of the endogenous variable for which the designated variable is directly responsible in the sense of the fraction which ould be found if thi factor varies to the same extent as in the observed data while all other variables (including the residual variables) are constant" (Land, 1971, p. 9). This coefficient is a Beta weight in a multiple regression analysis.

Total Effect: "The concept of the total effect is merely an indication of the agregate effect of an exogenous variable on an endogenous variable through all possible direct and indirect paths" (Land, 1971, p. 17). The total effect is equal to the correlation between the two variables under consideration.

Total Indirect Effect: The sum of all the indirect effects of an exogenous variable, through all of the other exogenous variables, upon an endogenous variable (Land, 1971).

Description of Path Analysis

The basic statistical methodology underlying PA is correlational analysis, both zero order (r) and multiple correlation (R). While correlational analysis does not yield causality information directly, the investigation of relationships can support causal inferences. Furthermore, if the variables being correlated are related to each other, in a temporal and theoretical manner, a causal inference can

be drawn. Also, if the degree and direction of relationship between two variables can be isolated or partialled out from a larger group of variables which are theoritically interrelated, a strong argument for causality can be drawn.

In order to provide an explanation of how PA utilizes correlational analysis, a theoretical, linear, temporal model is provided as an example in Figure 1. The verbal model simply stated theorizes that both vocational maturity (VM) and IQ in ninth grade have an effect on future occupational aspiration level in tenth and twelfth grades. The ultimate endogenous or criterion variable in this model can be causally effected directly and indirectly through an intervening variable by either of the ninth grade exogenous variables. The direction and degree of this effect can be tested using PA. The simplest form of the Path Theorm states:

$$r_{ij} = \sum_k P_{ik} r_{kj}$$

Where: r = correlation coefficient

p = path coefficient

i = number of the dependent variable

j = number of the independent variable

k = index of all numbers between j and i, including j,

(Land, 1971, p. 26)

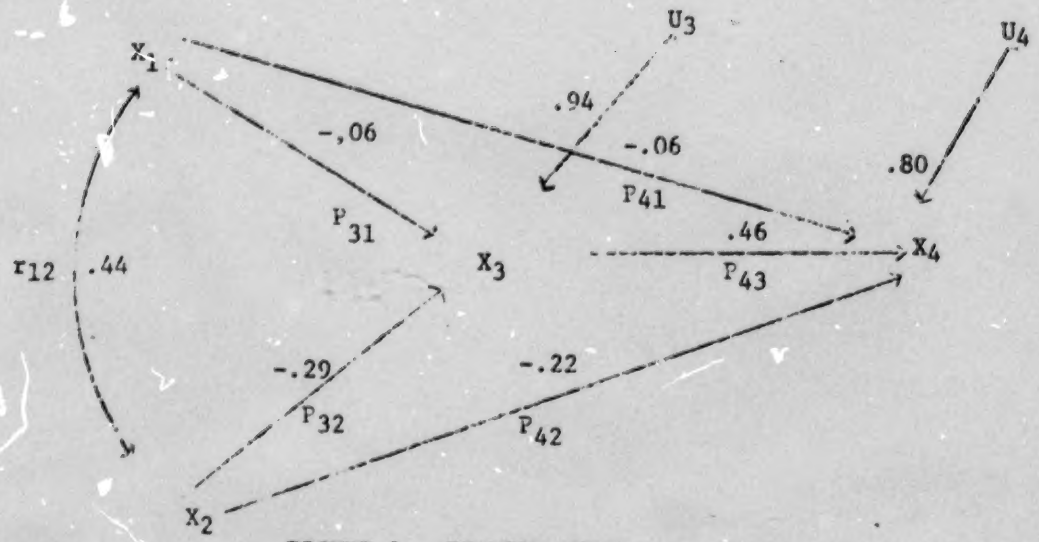

FIGURE 1. EXAMPLE MODEL

$r_{24} = -.396$

$r_{23} = -.33$

$R_{123,4} = -.60$

X_1 = Vocational Maturity - Ninth Grade

X_2 = IQ as measured by GATB-G - Ninth Grade

X_3 = Occupational Aspiration - Tenth Grade

X_4 = Occupational Aspiration - Twelfth Grade

(The above model was developed at The Pennsylvania State University by Enderlein, Kapes, O'Reilly and Warland, 1972, and published by Enderlein, 1974).

A verbal statement of the model is:

Total Effect = Direct Effect + Indirect Effect

Where: Total Effect = Correlation Coefficient (r_{ij})

Direct Effect = Standarized Path Coefficient or Beta Weight for variable j with all other k variables partialled out.

Indirect Effect = (Standarized Path Coefficient - ik) x (Correlation Coefficient r_{ij})

While more complex forms of the path theorum have been suggested by Spady and Greenwood (1970), Duncan (1971), and Charner and Cohen (1973) which introduce additional concepts such as causal, non-causal, and spurious effects, these variations are not presented here in order to keep the example as simple as possible. With reference to the model presented, the Total Effect of X_2 (ninth grade IQ) on X_4 (twelfth grade occupational aspiration level) is examined below to determine the amount of Direct Effect and Indirect Effect through X_3 (tenth grade occupational aspiration level).

$$r_{24} = P_{42} + P_{43}\, r_{32}$$

$$-.396 = -.22 + (.46)\ (-.33)$$

$$-.396 = -.22 + (-.1518)$$

$$-.396 = .3718 + \text{"Spurious Effects"}$$

The introduction of the term "Spurious Effects" is necessary since the other variable (X_1) in the model consumes a small portion of the variance although it is not causally involved due to its non-significant path coeficient.

This particular test of the path 42 indicates that the greatest amount of the effect of X_2 operates or causes X_4 directly rather than indirectly through the intervening variable X_3. It can be noted from figure 1 that all Exogenous and Endogenous independent variables in the model have a total relationship with the ultimate dependent or criterion variable X_4 of R = -.60. However, even a total multiple R of this size leaves a considerable amount of unexplained variance or residual (U). The residual for the model is calculated according to the following formula:

$$U = \sqrt{1 - R^2}$$

$$U = \sqrt{1 - (.60)^2}$$

$$U = .80$$

Benefits of Path Analysis

From the preceding example, a number of important points become evident. First of all, even in a model as simple as the example presented, there are many possible recurrsive paths. Secondly, although a great deal of the ultimate Endogenous criterion variable X_4 was explained, a major portion (80%) is still unexplained. However, the major benefit of PA does not lie in its ability to predict, because prediction is a straight-forward MRA problem. The major advantage of PA is in examining the various paths to see if our hypotheses about relationships along theoretically meaningful

variables appear to be useful. While it is important to achieve a fairly large multiple R in the total model to have any worthwhile paths to examine, it is the relative strengths of various paths which hold theoretical importance. Furthermore, when a path in a model is actually a path in time such as the movement of students through a curriculum, this theoretical importance takes on practical importance. As educational researchers and especially vocational educators and vocational guidance specialists cooperate to produce a "career education" curriculum, investigation into its effectiveness may be best studied by applying PA to longitudinal data. Many process and product evaluation models can be hypothesized which are testible using PA, however, it would be a mistake to begin testing such hypothesized models until they were refined to a point where causal inferences could be supported. The temptation to include as many variables as possible in a MRA analysis and then attempt to explain this analysis through PA must be resisted.

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Patterns Related To Employment Satisfaction: A Causal Model Analysis[1]

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INTRODUCTION

The wealth of any nation is based upon its ability to effectively educate and utilize its human resources. As compared to natural resources, human resources may be described as the catalysts which transform an idea from an abstract concept into goods and services. Thus, human resources development is the people-oriented approach to the development of the nation's resources.

Historically, the United States has pursued only two human resource macro-policies. One is immigration, the second is public supported education. The national manpower supply/demand ratio was regulated through use of the first policy, immigration. That policy placed little emphasis upon education and, for the most part, concentrated upon the training of workers to fill specific jobs.

The second policy, public supported education, provides the financial resource for the most widely used vehicle in the development of human resources, formal education. Formal education is perhaps the most common and effective method for the development of skills, knowledges and capabilities of individuals, who represent this or any nation's human resources. Public support for education demonstrates this nation's commitment to the educational development of its citizens. The overriding rationale for this support is the concern of manpower planners for eliminating the waste or underutilization of our human resources in terms of skills and abilities.

One of the outcomes of the socio-educational process should be the merging of all forces which act upon an individual so that the individual is able to deal effectively with the environment. Work is an

integral part of an individual's environment. The ability of an individual to work consistently, and to receive satisfaction from this work, is necessary if society is to reduce wastage in terms of its human resources. Job or work satisfaction must become a concern for educators if society is to fully develop its human resources.

Since high school represents for some the last experience in a formal educational situation before entering into a lifetime of work, consideration must be given to in-school student characteristics and variables. Once identified, it is with these variables that the school system is able to work in order to promote change, which relates to the total growth potential of the individual and to the well-being of society.

PURPOSE OF THE STUDY

This study was part of a continuing longitudinal effort in vocational development research initiated in 1968 by members of the faculty and staff of the Department of Vocational Education at The Pennsylvania State University under the title Vocational Development Study (VDS). The study was conducted at a point in time when vocational education research is witnessing a merging of the needed longitudinal data and the sophisticated methodology required for the analyses of such time series data. The statistical methodology used in this study was Path Analysis, along with Pearson Product Moment Correlation and Multiple Regression Analysis. Path Analysis is a technique for examining interrelated variables in a causal model for which exogenous variables can be assumed to determine endogenous variables. Multiple Regression Analysis is the underlying mathematical framework for Path Analysis.

Pearson Product-Moment Correlations were used to test the relationships among all variables in the model.

This study was considered as an initial effort in vocational education research to develop and evaluate a linear recursive path model using in-school student characteristics in relationship to the criterion variable, job satisfaction, as measured by The Minnesota Satisfaction Questionnaire.

The model which was developed was based on longitudinal data collected over five points in time: ninth, tenth, eleventh, and twelfth grades, and one year after graduation. The independent variables were chosen from the three psychological domains: cognitive, affective and psychomotor. In addition, measures of socioeconomic status, curriculum choice and achievement were used. These variables were chosen on a priori basis using theoretical considerations and the results of previously conducted pilot studies. The model was evaluated in an attempt to uncover paths, both direct and indirect, which related job satisfaction to in-school student characteristics.

Specifically, the purpose of this study was to:

1. Develop a theoretical model for predicting employment satisfaction one year after graduation using ninth to twelfth grade in-school variables based upon a review of previous research and pilot studies.
2. Evaluate the validity and usefulness of the model in predicting job satisfaction, using representative samples of males and females, males only and females only.

FINDINGS

There were four criterion variables in the model developed in this study which were evaluated using the total sample (N = 208), and the separate male (N = 89),and female (N = 119) samples from the Altoona, Pennsylvania secondary school system. These four variables were: High School Curriculum (Vocational, Nonvocational), Achievement (Grade Point Average - 11th grade), Vocational Maturity (Vocational Development Inventory - 12th grade), and Work Satisfaction (Minnesota Satisfaction Questionnaire - 1 year after graduation from high school).

The first criterion variable to be considered in the model was Curriculum (Vocational-Nonvocational). The only student characteristic significantly related to Curriculum was the Sex variable, in the total sample which accounted for about 4 percent of the Curriculum variable. The Curriculum variable was not predictable by the combination of variables in the other two samples.

Achievement (GPA) was the next criterion variable to be analyzed and was found to be the most predictable of the four. Of the characteristics used in the model, General Aptitude Test Battery (GATB-G), Sex, Occupational Value "Salary," and Curriculum accounted for 29 percent of the variable GPA in the total sample. About 26 percent of the variable GPA was next predicted by GATB-G and Occupational Value "Salary" in the female sample. GATB-G and Curriculum were significantly related to GPA in the male sample and accounted for approximately 20 percent of the GPA variable.

The third criterion variable to be analyzed was Vocational Maturity (VDI). GPA was significantly related to the VDI in the total sample and the female sample accounting for about 12 percent of the VDI variable

in each. Occupational Value-"Interest and Satisfaction," along with GPA, were related to the VDI in the male sample only, and accounted for about 8 percent of that variable.

Employment Satisfaction (MSQ) was the final criterion variable to be considered in the model. The variables: Occupational Values-"Interest and Satisfaction," and "Salary," and Vocational Maturity (VDI), (all variables from the affective domain), were significantly related to the MSQ in the total sample and the female sample and accounted for about 5 and 10 percent of that variable respectively. The MSQ was not predictable by the variables in the model for the male sample, but was predictable in the female sample and the total sample. The variables which were useful in predicting job satisfaction were all associated with the affective domain. These variables were: Occupational Values--"Interest and Satisfaction" and "Salary," and Vocational Maturity.

Path Analysis and Vocational Development Research

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During the past two decades, and recently escalated by the introduction of the term Career Education, the attention of educators, counselors, and researchers has been shifting from occupational to career data. More than semantic, this shift has necessitated consideration of behavior over long time periods rather than only the characteristics of the transition from school to work or an occupational choice within a restricted time period. Increasingly, this has required a movement from interest in the relationship between individual traits and occupational factors to the continuities and discontinuities of working life, essentially the substance of vocational development.

Indeed, the concept of vocational development (or career development if you prefer) is itself a euphemism for the complex interactions between the affective, cognitive and psychomotor characteristics of persons potentially mediated by their values, family history, school climate, community reward system and many other possible variables which may or may not be affected by time. These are the elements of career. As Super has suggested, in a career model we are interested in the prediction of the sequence of positions which a person will occupy as he pursues his career (Super, 1969). To achieve this understanding of careers, however, we need to understand not only the positions which people occupy during the course of their working life but also the interrelationship of factors which caused them to anticipate, plan, and implement one position rather than another at any given point in their life as well as the threads which link one choice to another or one position to

the subsequent one. Our progress toward such goals has been dependent upon the availability of statistical methods capable of handling the data pertinent to understanding the myriad of factors feeding into vocational development and upon hardward (computers primarily) which allow a researcher to cope with sophisticated analyses of an enormous number of data points. Hardware problems are rapidly disappearing but questions of statistical methodology continue to be formidable obstacles as we move forward with time series data.

Obviously, not all elements of vocational development require the same levels of sophistication nor the same purpose as do time series questions. It has been and is necessary to conduct survey research by which the variables deserving systematic study in vocational development can be identified. Questions such as what vocational behaviors develop as the individual matures? Are there group differences in the development of vocational behavior? fall within this category (Crites, 1971). Technique research is also necessary to vocational development--the work of Crites on the Career Maturity Inventory, Westbrook on Cognitive Vocational Development Inventory, Super on the Work Values Inventory--are each examples of efforts to create ways of collecting information which is pertinent to vocational development and quantifiable. Such research concerns the internal structure of such instruments as well as their relationship to external criteria determined largely by survey research to be important to vocational development. Theoretical research has represented a stimulus to or an outcome of the survey and technique research cited. In this theoretical arena, hypothesis testing has attempted to evaluate the assumptions that vocational development is continuous and longitudinal, that it can be described as composed of different developmental tasks at different life periods, that vocational development and personal development more broadly conceived are related,

that vocational development can be modified by certain forms of intervention, or that specific variables are associated with the characters of vocational development at some point in time. Applied research, too, has been moving forward in testing various attempts to facilitate vocational development through the formal processes of schooling or other educative methods.

The statistical methods used in these four research areas have included:

1. Discriminant analysis as a way of examining predictive validity in regard to group membership particularly where the criterion variables are nominal or ordinal; rather than continuously measured traits or where the predictor variables are multidimensional as found in personality profiles. This approach has been important to our understanding of the personality variables by which career or curriculum groups are separated in measurement space.
2. Analysis of variance--while important as a part of discriminant analysis strategy and frequently the statistic of choice for testing the null hypothesis, it has often been used as a descriptive or classification method rather than in an experimental form. As such it has helped in the identification of shifts in means on some dependent variable over time but has not advanced our understanding of the dynamics underlying such shifts as much as we would hope.
3. Correlational analysis has also been widely used as a way of determining the predictive power of certain individual traits or trait sets to different classes of career-related criterion variables--academic decisions, vocational aspirations, and vocational adjustment. Indeed, the various correlational modes,

parametric and nonparametric, have been highly valuable particularly in identifying associations between variables requiring further study. Certainly, Multiple Regression and Partial Correlation have been exceedingly valuable in our understanding of the ranking or weights of predictive variables in relation to each other. In some instances, canonical correlations have been helpful in analyzing the stability of the disperson over time (Gribbons and Lohnes, p. 32), determining the full extent of the interrelatedness of two sets of scores and as an index to the amount of common variance shared by the functions of two sets of measurement.

4. Essentially, the approaches which have just been identified are linear and they represent an independent variables predicting of dependent variables paradigm in which "the criterion variable is 'explained' by the pattern of its statistical dependency on a set of predictors . . . . Generally, the effort is to account for as much of the variance in the criterion as possible from the predictors' variance-covariance" (Gribbons and Lohnes, p. 185). Gribbons and Lohnes have attempted to move outside this perspective by using a stochastic model, in particular Markov chain analysis, to examine the outcomes of a discrete measurement variable. Markov chains are probability models that can tell us how much of the variance in developmental outcomes can be explained by a theoretical model of the process itself without recourse to functional or statistical relations with outside variables (p. 186). Esentially, the model observes the paths taken by the subjects

> through the states of the variable over temporally separated stages to see if there is a probability law inherent in the "process" (the tree structure of possible paths through the states over the stages). Beyond the work of Gribbons and Lohnes and of Robert Steer in the Career Pattern Study, no one has yet applied Markov chains to career positions rather than career plans. In essence, Markov chains represent a very complex schema for setting up expectancy tables dealing with one variable (Super, 1969, p. 10). Certainly, there are considerably easier ways to arrive at that outcome.

Super has contended that in addition to using Markov chains for looking at longitudinal relationships in vocational development, other promising alternatives might include lattice theory, career trees and path analysis. The first two of these have had some trial but it has not been extensive and there have been a considerable series of statistical problems which are not yet resolved. Which brings us back to path analysis. Essentially, path analysis is the best method we now know to handle longitudinal data, not simply cross-sectional data at different points in time. More important, perhaps, is the fact that most of the statistical techniques we have used deal with direct effects, X on Y, rather than indirect effects among variables. However, path analysis facilities the examination of the cumulative indirect effects of a variable on some other variable. As Dr. Kapes, Dr. Enderlein, and Dr. O'Reilly will describe to us, it is a fact that the indirect effects of some variables over time are more influential on some behavior than is the short-time direct effect of some other variables. Since Dr. Enderlein and Dr. O'Reilly will be dealing with these matters I will not pursue them further but defer to him at this time. Thank you for your attention.

PATH ANALYSIS: AN INVESTIGATION OF STABILITY OF EXPRESSED OCCUPATIONAL CHOICE

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Presented at the
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INTRODUCTION AND BACKGROUND

There has been considerable discussion about and investigation of occupational-vocational choice in recent years. Since the early fifties, many scholars have been actively engaged in attempts to shed light upon facets of this process which were of particular interest to them. One issue, which seems to have strong implications in terms of the educational process, which has not received extensive attention is that of the stability of occupational choice. More specifically, there have been few attempts to predict the stability of the expressed occupational choices of secondary school students.

At the present time, a time in the evolution of our educational process when terms like accountability and individually prescribed instruction are common, an investigation focusing upon when stable occupational choices are made and how they can be identified would appear to be of paramount importance. If the main goal of education is to prepare students to become productive, participating members of society, it would seem important to know what occupation they will most likely pursue upon leaving the formal educational setting. By the same token, it would appear to be a much simpler task for educators to prescribe programs to meet an individual student's needs if some indicator of the stability of his or her occupational choice was available.

Casual observation reinforces the findings of researchers that individuals develop at different rates physically, socially, and vocationally. Schools have tended to ignore this fact, perhaps partially because of

societal pressure, and have traditionally required all students to make some type of a vocational choice at approximately ninth grade. Within the recent past, some have questioned this practice. Super and Overstreet (1960, p. 109) stated, "Ninth graders tend to be psychologically ready for vocational exploration, but not for vocational choice." A somewhat different point of view is represented by McDaniels (1968). He stated, "Youth are not too young to choose, only too poorly prepared to make choices. .... Youth are making choices. The concern is whether the choices are informed ones." (pp. 242 & 244).

The importance of students making occupational choices as early as possible in the secondary school years is supported by Marr (1965). She found that early deciders were most likely and able to implement their most desired occupation. The act of not making an occupational choice could, in fact, be viewed as being an occupational decision. Super (1960) has proposed that as a result of their practical, if not theoretical, irreversibility all occupational decisions will influence the course of a student's life. Therefore it could be argued that encouraging the postponement of occupational choices for all students during the early secondary school years seems as invalid as is the practice of requiring that all students make occupational choices at a specific time. The crucial problem seems to be in determining when each student has reached that point in his or her vocational development at which his or her expressed occupational choice will remain stable. The timing of these decisions is extremely important for as Holt (1972) points out, education not only opens doors, but also closes doors.

Even a superficial review of the literature leaves one with the impression that although there is considerable speculation and theorizing about the occupational choice process, few concrete facts are available.

This is especially true when dealing specifically with the stability of occupational choices and predicting the stability of occupational choices. While it is true that several stability studies have been done, these have generally dealt with the stability of level of aspiration (LOA) or with the stability of choices within a category of occupations. Few studies can be found which have investigated the stability of occupational choices by utilizing actual job titles. Flanagan and Cooley (1966) address this problem when they state, "Obviously, the extent to which plans are considered stable depends upon how one classifies plans in the first place. For example, plans will appear to be more stable if broader categories are used." (p. 182).

THE PURPOSE OF THE STUDY

The purpose of this study was to develop a model for predicting the stability of the expressed occupational choices of secondary school students based upon the findings of previous research. Additionally, the validity and strength of the proposed model was to be investigated and modifications made to improve the model. This proposed model was to deal with the years from ninth to twelfth grade and would differentiate between those students whose expressed occupational choices would remain stable during that time period and those students whose expressed occupational choices would fluctuate. The prediction model utilized various student characteristics and achievement variables as predictors which previous research had found were related to occupational choice or the stability of occupational choice.

THE SAMPLE AND METHODOLOGY

The Sample

In 1968, a longitudinal study of career development, the Vocational Development Study (VDS), was initiated by the Department of Vocational

Education at The Pennsylvania State University. The sample used during the course of the present study was drawn from the VDS data bank. The sample consisted of 550 male and female students, or fifty percent of the VDS population of approximately 1,100, for whom complete data for the years from ninth to twelfth grade was available.

Essential Data

A review of previous research indicated that a wide variety of student characterisitcs have been found to be related to occupational choice in some manner. In an effort to maximize the usefulness and efficiency of the proposed model, it was decided that a variety of easily obtainable student characteristic variables should be included in the model. In all, twenty variables were used to construct the initial model to predict stability of expressed occupational choice. These variables were:

Curriculum - Curriculum was coded as a dichotomy, vocational versus academic (non-vocational) according to mid-term tenth grade enrollment.

General Aptitude Test Battery (GATB) Scales "G" and "M" - Scale "G" is a measure of learning ability while scale "M" is a measure of manual dexterity.

Grade Point Average (GPA) - The degree of general success the student enjoyed in the school environment as indicated by both ninth and tenth grade GPA.

Level and Stability of Occupational Choice - The students' expressed occupational choices at ninth, tenth, and twelfth grades were coded according to Roe's (1956) classification scheme. Level of Occupational Choice for ninth and tenth grade as well as Stability of Expressed Occupational Choice from ninth to tenth grade were included as predictors.

Sex - Although some controversy surrounds the existence of sex dif-

ferences, it was decided to initially include sex as a variable.

Socioeconomic Status - Bonjean, Hill, and McLemore (1968, p. 385) have recommended a formula for "Index of Social Position" which is an indicator of each student's socioeconomic background.

Values - The students' values for Interest and Satisfaction, Prestige, Salary, and Security were measured at ninth and tenth grades using the Occupational Values Inventory (OVI) described by Impellitteri and Kapes (1971)

Vocational Maturity - The Vocational Development Inventory (VDI) described by Crites (1965) was used to measure each student's vocational maturity at ninth and tenth grades.

The final criterion variable, Stability of Expressed Occupational Choice from ninth to twelfth grade, was viewed as a dichotomy, stable versus unstable. The determination of stability was made by examining the actual job titles expressed by each student as his or her occupational choice at ninth, tenth and twelfth grades. If the job titles were the same in all three cases, except for minor refinement, the student was coded as stable in terms of expressed occupational choice. Determinations of the stability of occupational choice from ninth to tenth grade, tenth to twelfth grade, and ninth to twelfth grade without regard to tenth grade choice were also possible.

Statistical Methodology

Super (1969) pointed out that Lattice Theory, Markov Chain Theory, and Path Analysis are three new methodologies which may prove useful in developing career models. The particular methodology utilized in the present study was path analysis, which is based upon multiple regression analysis (MRA). The theoretical assumptions which must be met to insure the validity of path analysis are the same as those pertaining to MRA.

Path analysis allows the investigator to examine the validity and reliability of constructs and measures. Most important, however, are the features of path analysis which allow the investigator to examine the indirect effect variables have upon the criterion through their effect upon other variables.

SUMMARY OF MAJOR FINDINGS

The Original Model

In order to provide a common basis from which to view the findings, as well as provide a statistical description of the sample, Tables 1 and 2 are included but are not extensively discussed. Table 1 displays the means and standard deviations for the variables and student characteristics used during the course of this study. Several obtained means are of particular interest. The obtained mean for the variable Sex was 1.49 which indicates the sample included slightly more males than females (283 males, 267 females). The obtained mean for the variable Curriculum was .53 indicating a slight predominance of non-vocational students in the sample (258 vocational, 292 non-vocational). Finally, the mean values for Stability of Expressed Occupational Choice Ninth to Tenth Grade and Ninth to Twelfth Grade were 1.52 and 1.34 respectively. Thus, fifty-two percent (286) of the sample expressed the same occupational choice in both ninth and tenth grades while thirty-four percent (185) remained stable in terms of their occupational choice from ninth to twelfth grade.

Table 2 presents the zero-order correlations among all of the variables excluding the final criterion variable, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). It should be noted that these correlation coefficients also represent the total effect any variable has upon another. The coefficients express the strength of the total effect but not whether that effect is of a direct or indirect nature.

Table 1: Means and Standard Deviations for All Variables

Variable No.	Variable Name	$\bar{X}$	SD
1.	Value-Interest and Satisfaction (Ninth Grade)	19.52	4.90
2.	Value-Salary (Ninth Grade)	12.67	7.18
3.	Value-Prestige (Ninth Grade)	11.50	5.09
4.	Value-Security (Ninth Grade)	12.13	5.68
5.	GATB-"G" (Intelligence	95.98	12.99
6.	GATB-"M" (Manual Dexterity)	89.38	18.22
7.	Sex	1.49	.50
8.	Socioeconomic Status	36.62	10.42
9.	Vocational Maturity (Ninth Grade)	35.40	4.76
10.	Level of Occupational Choice (Ninth Grade)	3.89	1.01
11.	GPA (Ninth Grade)	3.43	.64
12.	Value-Interest and Satisfaction (Tenth Grade)	20.37	4.75
13.	Value-Salary (Tenth Grade)	13.67	7.74
14.	Value-Prestige (Tenth Grade)	9.83	5.35
15.	Value-Security (Tenth Grade)	10.23	5.45
16.	Vocational Maturity (Tenth Grade)	36.14	4.69
17.	Curriculum (Mid-Term Tenth Grade)	.53	.50
18.	GPA (Tenth Grade)	3.20	.78
19.	Stability of Expressed Occupational Choice (Ninth to Tenth Grade)	1.52	.50
20.	Level of Occupational Choice (Tenth Grade)	3.82	.99
21.	Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)	1.34	.53
22.	Stability of Expressed Occupational Choice (Tenth to Twelfth Grade)	1.45	.51

Table 2. Zero-order Correlations Among All Variables Except the Final Criterion, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)

Variables	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Interest and Satisfaction[a]	-.46	-.13	-.16	.29	.04	.22	.14	.30	.16	.24	.51	-.25	-.08	-.04	.28	.13	.30	-.02	.18
2. Salary[a]		-.14	-.24	-.11	.02	-.24	-.02	-.20	-.22	-.18	-.33	.47	.01	-.08	-.16	-.12	-.19	-.08	-.16
3. Prestige[a]			-.17	.00	-.04	.08	.04	-.10	.09	.02	-.10	-.05	.43	-.08	-.15	.09	-.01	-.02	.05
4. Security[a]				-.15	-.09	-.01	-.03	-.09	-.01	-.11	-.02	-.19	-.13	.45	-.08	-.05	-.10	.05	-.06
5. GATB "G"[a]					.20	-.10	.19	.43	.39	.56	.22	-.01	-.08	-.16	.37	.10	.58	.07	.41
6. GATB "M"[a]						-.03	.04	.15	.11	.20	-.03	.05	-.02	-.08	.09	.04	.16	.02	.08
7. Sex							-.02	.05	-.07	.10	.20	-.24	.07	.03	.07	.19	.00	.06	-.05
8. Socioeconomic Status								.14	.19	.13	.10	.01	.00	.00	.11	.18	.18	.00	.22
9. Vocational Maturity[a]									.22	.41	.27	-.07	-.10	-.11	.61	.03	.45	.17	.19
10. Level of Occupational Choice[a]										.35	.14	-.06	.00	-.06	.17	.35	.30	-.03	.66
11. GPA[a]											.16	-.01	-.04	-.13	.32	.16	.68	.09	.36
12. Interest and Satisfaction[b]												-.50	-.15	-.05	.28	.12	.22	.02	.18
13. Salary[b]													-.10	-.28	-.14	-.08	-.02	-.02	-.10
14. Prestige[b]														-.20	-.15	.03	-.08	-.01	.02
15. Security[b]															-.09	-.01	-.10	.05	-.05
16. Vocational Maturity[b]																.00	.38	.20	.16
17. Curriculum[b]																	.11	-.08	.34
18. GPA[b]																		.17	.36
19. Stability of Expressed Choice[c]																			.04
20. Level of Occupational Choice[b]																			

[a]Ninth grade data [b]Tenth grade data [c]Ninth to tenth grade

Table 3 displays the zero-order correlations between the final criterion variable, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade), and all other variables used in the model. These correlations equal the total effect each variable has upon the final criterion. Seven of these relationships were found to be significant at the .05 level, but statistical significance is not necessarily an important prerequisite for including or retaining a variable in a path analysis model.

The final preliminary information needed before computing path coefficients is the relationships among the exogenous variable (i.e., variables without predecessors). The correlation coefficients presented in Table 4 indicate the degree of relationship or independence of the exogenous variables as well as being necessary to compute the indirect effects of these variables.

A model was proposed and built using the twenty student characteristic variables and the criterion variable previously described and listed as follows:

X_1 = Value of Interest and Satisfaction (Ninth Grade)

X_2 = Value of Salary (Ninth Grade)

X_3 = Value of Prestige (Ninth Grade)

X_4 = Value of Security (Ninth Grade)

X_5 = GATB "G" Score (Ninth Grade)

X_6 = GATB "M" Score (Ninth Grade)

X_7 = Sex

X_8 = Socioeconomic Status

X_9 = Vocational Maturity (Ninth Grade)

X_{10} = Level of Occupational Choice (Ninth Grade)

X_{11} = GPA (Ninth Grade)

X_{12} = Value of Interest and Satisfaction (Tenth Grade)

Table 3: Zero-Order Correlations of the Twenty Exogenous and Endogenous Variables with the Final Criterion, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)[a]

	Variable	r
1.	Interest and Satisfaction[b]	-.01
2.	Salary[b]	-.04
3.	Prestige[b]	-.02
4.	Security[b]	-.02
5.	GATB "G"[b]	.11*
6.	GATB "M"[b]	.09*
7.	Sex[b]	-.02
8.	Socioeconomic Status[b]	.04
9.	Vocational Maturity[b]	.15
10.	Level of Occupational Choice[b]	-.03
11.	GPA[b]	.07
12.	Interest and Satisfaction[c]	.03
13.	Salary[c]	.01
14.	Prestige[c]	-.01
15.	Security[c]	-.02
16.	Vocational Maturity[c]	.15*
17.	Curriculum[c]	-.14*
18.	GPA[c]	.19*
19.	Stability of Expressed Choice[d]	.49*
20.	Level of Occupational Choice[c]	.03

[a]The zero-order correlation is equal to the total effect of the variable upon the criterion

[b]Ninth grade data

[c]Tenth grade data

[d]Ninth to tenth grade

*Significant at .05

Table 4: Zero-Order Correlations Among the Exogenous Variables of the Proposed Model

Variable	2	3	4	5	6	7	8
1. Interest and Satisfaction[a]	-.46	-.13	-.16	.29	.04	.22	.14
2. Salary [a]		-.14	-.24	-.11	.02	-.24	-.02
3. Prestige[a]			-.17	.00	-.04	.08	.04
4. Security[a]				-.15	-.09	-.01	-.03
5. GATB "G"[a]					.20	-.10	.19
6. GATB "M"[a]						-.03	.04
7. Sex[a]							-.02
8. Socioeconomic Status[a]							

[a]Ninth grade data

X_{13} = Value of Salary (Tenth Grade)

X_{14} = Value of Prestige (Tenth Grade)

X_{15} = Value of Security (Tenth Grade)

X_{16} = Vocational Maturity (Tenth Grade)

X_{17} = Curriculum (Mid-term Tenth Grade)

X_{18} = GPA (Tenth Grade)

X_{19} = Stability of Expressed Occupation Choice (Ninth to Tenth Grade)

X_{20} = Level of Occupational Choice (Tenth Grade)

X_{21} = Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)

Variables X_1 through X_8 were defined as exogenous variables in the original model. The model as originally proposed is presented in Figure 1. It should be noted that the residual variables and the paths associated with them have not been included for the sake of simplicity. All the paths depicted in Figure 1 are projected as running from left to right.

The path coefficients, which are equal to the direct effects, for all the paths shown in Figure 1 were computed along with the indirect and residual effects. The computed effects associated with the twenty indepent variables upon the criterion variable, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade) are shown by Table 5. Stability of Expressed Occupational Choice (Ninth to Tenth Grade)was found to be the best predictor of the consistency of the students' occupational choice throughout the secondary school years. The total effect of this variable was computed to be .49 most of which, .45, operated upon the criterion in a direct manner.

The computed effects associated with several additional predictors bear mentioning also, GPA (Tenth Grade) and GPA (Ninth Grade) were found to have important influences upon the criterion. The tenth grade measure

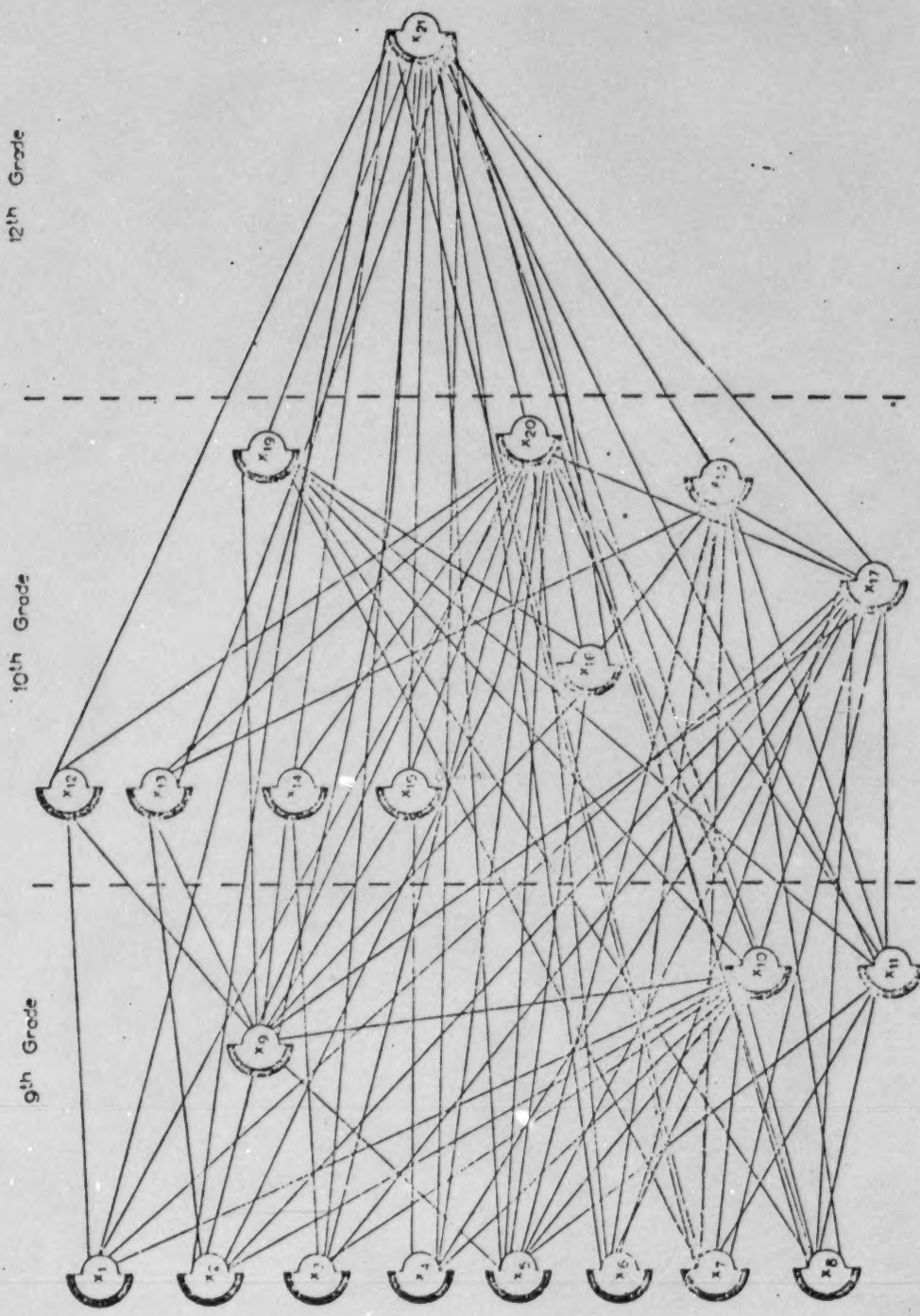

Figure 1. Proposed Model

Table 5: Effects Upon the Variable Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)

	Variable	Total Effect	Direct Effect	Total Indirect Effect
1.	Interest and Satisfaction[a]	-.01	-.07	.06
2.	Salary[a]	-.04	-.05	.01
3.	Prestige[a]	-.02	-.02	.00
4.	Security[a]	-.02	-.04	.02
5.	GATB "G"[a]	.11	.03	.08
6.	GATB "M"[a]	.09	.07	.02
7.	Sex	-.02	-.01	-.01
8.	Socioeconomic Status	.04	.03	.01
9.	Vocational Maturity[a]	.15	.02	.13
10.	Level of Occupational Choice[a]	-.03	-.05	.02
11.	GPA[a]	.07	-.09	.16
12.	Interest and Satisfaction[b]	.03	.05	-.02
13.	Salary[b]	.01	.03	-.02
14.	Prestige[b]	-.01	.02	-.03
15.	Security[b]	-.02	-.01	-.01
16.	Vocational Maturity[b]	.15	.00	.15
17.	Curriculum[b]	-.14	-.12	-.02
18.	GPA[b]	.19	.13	.06
19.	Stability of Expressed Occupational Choice[c]	.49	.45	.04
20.	Level of Expressed Occupational Choice[b]	.03	.03	.00
	Residual	.85		

[a]Ninth grade data

[b]Tenth grade data

[c]Ninth to tenth grade

inflenced the criterion largely in a direct manner, being associated with a total effect of .19 and a direct effect of .13. On the other hand, GPA (Ninth Grade) operated upon the criterion mainly through indirect paths, being associated with a total effect of .07 but a total indirect effect of .16. The main indirect paths were found to be through GPA (Tenth Grade) and Stability of Expressed Occupational Choice (Ninth to Tenth Grade). Vocational Maturity at both ninth and tenth grades were found to have a total effect of .15 and both operated almost exclusively through indirect paths. Both were found to operate through GPA (Tenth Grade) and Stability of Expressed Occupational Choice (Ninth to Tenth Grade). Two other predictors were associated with relatively large effects, Curriculum with a total effect of -.14 and GATB "G" found to have a total indirect effect of .08.

It was interesting to note that several variables generally assumed to affect stability of occupational choice were found to be associated with relatively small effects. None of the four value measures used as predictors was found to have much effect upon the criterion, Interest and Satisfaction (Ninth Grade) having the largest effect. Similarly, Level of Occupational Choice at either ninth or tenth grade was found to have little effect upon the criterion. Socioeconomic status was another variable which although widely suspected as a predictor of the stability of occupational choice was found to have little effect upon the criterion. Finally, the residual was computed to have a value of .85. This indicates that the model explained approximately twenty-eight percent of the variance in the criterion, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade).

The Revised Model

In light of the small relationships which were found between several of the predictor variables and the final criterion, it was decided to revise the original model. The resulting revised model used only variables which had been included in the original model but eliminated those variables which had the least predictive value. The objective of this model revision was to simplify the model without sacrificing efficiency. The predictor variables included in the revised model were:

X_1 = Value of Interest and Satisfaction (Ninth Grade)

X_5 = GATB "G" Score (Ninth Grade)

X_6 = GATB "M" Score (Ninth Grade)

X_9 = Vocational Maturity (Ninth Grade)

X_{10} = Level of Occupational Choice (Ninth Grade)

X_{11} = GPA (Ninth Grade)

X_{12} = Value of Interest and Satisfaction (Tenth Grade)

X_{16} = Vocational Maturity (Tenth Grade)

X_{17} = Curriculum (Mid-term Tenth Grade)

X_{18} = GPA (Tenth Grade)

X_{19} = Stability of Expressed Occupational Choice (Ninth to Tenth Grade)

The revised model is depicted in Figure 2.

The effects associated with those variables included in the revised model were computed and are displayed in Table 6. At the outset it is important to note that the computed value for the residual was .85. Thus the revised model explained approximately twenty-eight percent of the variability in the final criterion, the same percentage explained by the original model. As would be expected, Stability of Expressed Occupational Choice (Ninth to Tenth Grade) was the most powerful predictor of the cri-

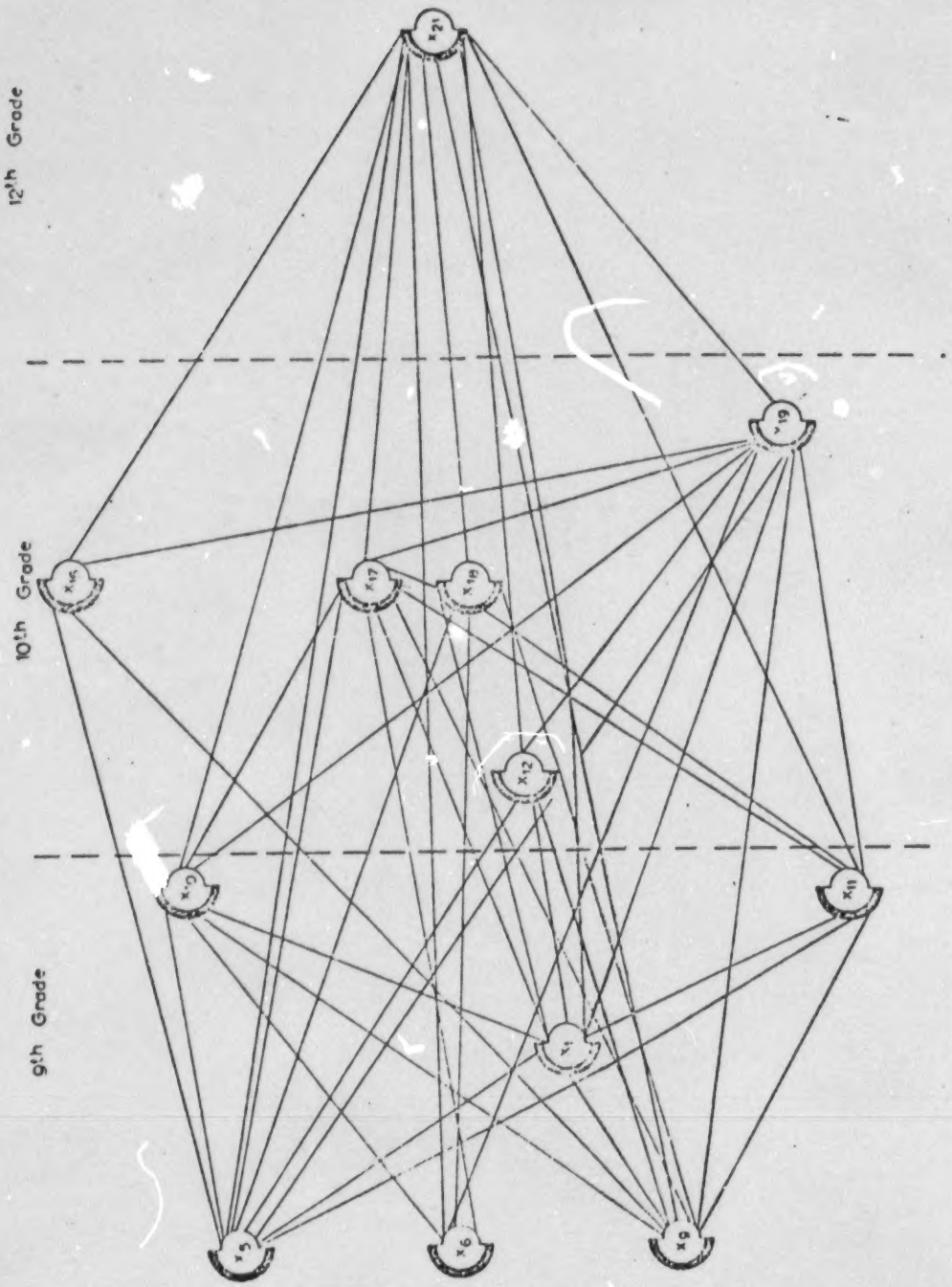

Figure 2. Revised Model

terion, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). GPA (Tenth Grade) was the second strongest predictor and was associated with effects indentical to those calculated for that variable in the original model. GPA (Ninth Grade) was again associated with an total indirect effect of .16. The ninth and tenth grade measures of Vocational Maturity, Curriculum, and GATB "M" maintained the same pattern of effects as found in the original model with only slight variation.

Two variables did exhibit interesting changes in the effects associated with them. Level of Occupational Choice (Ninth Grade) dropped from a direct effect of -.05 in the original model to a direct effect of -.02 in the revised model. This decrease in the direct effect of Level of Occupational Choice (Ninth Grade) produced a decrease in the total indirect effect from .02 in the original model to -.01 in the revised model. The value Interest and Satisfaction (Tenth Grade) was also found to have changed in the manner in which it operated upon the criterion from the original to the revised model. In the revised model, Interest and Satisfaction (Tenth Grade) was associated with a direct effect only while in the original model both direct and indirect effects had been found.

The major indirect paths and their computed effects for the variables Interest and Satisfaction (Ninth Grade), GATB "G". Vocational Maturity (Tenth Grade) are shown in Table 7. It is interesting to note that in all but two cases, the effects associated with the major indirect paths were found to be equal to or greater than the direct effects associated with the various variables.

Additional Model Modification

In order to further investigate the usefulness of the predictive model, several modifications were made to either the model or the criterion variable. Since the predictor variable, Stability of Expressed Occupational Choice (Ninth to Tenth Grade), is somewhat confounded with the final

Table 6: Effects Upon the Variable Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)

	Variable	Total Effect	Direct Effect	Total Indirect Effect
1.	Interest and Satisfaction[a]	-.01	-.05	.04
5.	GATB "G"[a]	.11	.04	.07
6.	GATB "M"[a]	.09	.07	.02
9.	Vocational Maturity[a]	.15	.03	.12
10.	Level of Occupational Choice[a]	-.03	-.02	-.01
11.	GPA[a]	.07	-.09	.16
12.	Interest and Satisfaction[b]	.03	.03	.00
16.	Vocational Maturity[b]	.15	.00	.15
17.	Curriculum[b]	-.14	-.11	-.03
18.	GPA[b]	.19	.15	.04
19,	Stability of Expressed Occupational Choice[c]	.49	.45	.04
	Residual	.85		

[a]Ninth grade data

[b]Tenth grade data

[c]Ninth to tenth grade

Table 7: Paths of Major Indirect Effects Upon the Variable Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)

Variable		Through		Variable	Indirect Effect
1.	Interest and Satisfaction[a]	11.	GPA[a]		-.02
1.	Interest and Satisfaction[a]	18.	GPA[b]		.05
5.	GATB "G"[a]	11.	GPA[a]		-.05
5.	GATB "G"[a]	18.	GPA[b]		.09
5.	GATB "G"[a]	19.	Stability of Expressed Occupational Choice[c]		.03
9.	Vocational Maturity[a]	11.	GPA[a]		-.04
9.	Vocational Maturity[a]	18.	GPA[b]		.07
9.	Vocational Maturity[a]	19.	Stability of Expressed Occupational Choice[c]		.08
11.	GPA[a]	18.	GPA[b]		.10
11.	GPA[a]	19.	Stability of Expressed Occupational Choice[c]		.04
16.	Vocational Maturity[b]	18.	GPA[b]		.06
16.	Vocational Maturity[b]	19.	Stability of Expressed Occupational Choice[c]		.09

[a]Ninth grade data

[b]Tenth grade data

[c]Ninth to tenth grade

criterion variable, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade), it was decided to investigate the strength of the model with the first stability measure deleted as a predictor. Table 8 displays the computed effects associated with the remaining 10 predictor variables after this modification. The effects associated with several of the predictor variables changed considerably. The value Interest and Satisfaction (Ninth Grade) became a stronger predictor with a direct effect of -.09 and a total indirect effect of .08. The direct effect of both the ninth and tenth grade measures of Vocational Maturity increased with a resultant decrease in the total indirect effect. Level of Occupational Choice (Ninth Grade) was also associated with a larger direct effect upon the criterion. Overall however, the model with Stability of Expressed Occupational Choice (Ninth to Tenth Grade) deleted as a predictor accounted for only nine percent of the variance in Stability of Expressed Occupational Choice (Ninth to Twelfth Grade).

The second modification investigated the effectiveness of the revised model using a revised criterion variable, Stability of Expressed Occupational Choice (Tenth to Twelfth Grade). The number of students who could be classified as stable increased from 185 when the criterion was the years from grades nine to twelve to 250 for the years from grades ten to twelve. Table 9 contains the computed effects of the predictor variables upon the revised criterion. The first major point to note is that the model explained only nine percent of the variance in the criterion. Secondly, all of the predictors except two, were found to have smaller total, direct, and total indirect effects upon the revised criterion than upon the original criterion. Especially worth note are the decreased effects of Stability of Expressed Occupational Choice (Ninth to Tenth Grade). Curriculum (Mid-Term Tenth Grade) became the most effective predictor of the new cri-

Table 8: Effects Upon the Variable Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)

	Variable	Total Effect	Direct Effect	Total Indirect Effect
1.	Interest and Satisfaction[a]	-.01	-.09	.08
5.	GATB "G"[a]	.11	.02	.09
6.	GATB "M"[a]	.09	.07	.02
9.	Vocational Maturity[a]	.15	.07	.08
10.	Level of Occupational Choice[a]	-.03	-.05	.02
11.	GPA[a]	.07	-.10	.17
12.	Interest and Satisfaction[b]	.03	.03	.00
16.	Vocational Maturity[b]	.15	.06	.09
17.	Curriculum[b]	-.14	-.13	-.01
18.	GPA[b]	.19	.23	-.04
	Residual	.95		

[a]Ninth grade data

[b]Tenth grade data

Table 9: Effects Upon the Variable Stability of Expressed Occupational Choice (Tenth to Twelfth Grade)

	Variable	Total Effect	Direct Effect	Total Indirect Effect
1.	Interest and Satisfaction[a]	-.01	-.03	.02
5.	GATB "G"[a]	.05	-.02	.07
6.	GATB "M"[a]	.01	.00	.01
9.	Vocational Maturity[a]	.06	-.03	.09
10.	Level of Occupational Choice[a]	-.01	.05	-.06
11.	GPA[a]	.06	.00	.06
12.	Interest and Satisfaction[b]	.01	.02	-.01
16.	Vocational Maturity[b]	.07	.01	.06
17.	Curriculum[b]	-.20	-.21	.01
18.	GPA[b]	.12	.11	.01
19.	Stability of Expressed Occupational Choice[c]	.22	.19	.03
	Residual	.95		

[a]Ninth grade data

[b]Tenth grade data

[c]Ninth to tenth grade

terion. Also, while the total effect of Level of Occupational Choice (Ninth Grade) decreased, the direct and total indirect effects of this variable increased.

Two additional modifications of the criterion variable, not originally reported as part of this study, were investigated. It was decided to classify the students as stable or unstable in terms of the field and the level of their expressed occupational choices as defined by Roe (1956). As would be expected, by applying a broader definition of stability, the number of students classified as stable increased. The number of students stable in terms of the field of their expressed occupational choices from ninth to twelfth grade was 306. Likewise, the number found to be stable in terms of the level of their expressed occupational choices from ninth to twelfth grade was 340.

The original model, all twenty predictor variables, was utilized to investigate the predicitability of the revised criterion variable, Stability of Expressed Occupational Choice by Field (Ninth to Twelfth Grade). Table 10 displays the computed effects associated with each predictor. The model was found to explain twenty-one percent of the variance in the final criterion. In predicting Stability of Expressed Occupational Choice by Field (Ninth to Twelfth Grade), several predictors were found to be associated with greater effects than had been the case when predicting the original criterion. Most notable of these were: the values Salary and Prestige, ninth and tenth grade; Level of Occupational Choice; and Curriculum (Mid-term Tenth Grade). Several other variables decreased in effectiveness. These were: Interest and Satisfaction (Ninth Grade); both GATB "G" and "N"; Vocational Maturity measured at ninth and tenth grade; and both measures of GPA

Table 10: Effects Upon the Variable Stability of Expressed Occupational Choice by Field (Ninth to Twelfth Grade)

	Variable	Total Effect	Direct Effect	Total Indirect Effect
1.	Interest and Satisfaction[a]	.02	.01	.01
2.	Salary[a]	-.05	-.09	.04
3.	Prestige[a]	-.05	-.01	-.04
4.	Security[a]	.02	-.01	.03
5.	GATB "G"[a]	.04	.01	.03
6.	GATB "M"[a]	.05	.06	-.01
7.	Sex	-.08	-.06	-.02
8.	Socioeconomic Status	-.04	-.02	-.02
9.	Vocational Maturity[a]	.08	.03	.05
10.	Level of Occupational Choice[a]	-.10	-.09	-.01
11.	GPA[a]	.01	-.02	.02
12.	Interest and Satisfaction[b]	.02	.05	.03
13.	Salary[b]	.01	.05	.04
14.	Prestige[b]	-.05	.01	-.06
15.	Security[b]	.03	.02	-.01
16.	Vocational Maturity[b]	.08	.01	.07
17.	Curriculum[b]	-.20	-.12	-.08
18.	GPA[b]	.06	.01	.05
19.	Stability of Expressed Occupational Choice by Field[c]	.42	.39	.03
20.	Level of Expressed Occupational Choice[b]	-.04	.06	-.10
	Residual	.89		

[a]Ninth Grade Data

[b]Tenth Grade Data

[c]Ninth to Tenth Grade Data

The final criterion variable was again modified to reflect stability of occupational choice by level. The original model was used to investigate this new criterion, Stability of Expressed Occupational Choice by Level (Ninth to Twelfth Grade). Table 11 contains the computed effect for the twenty predictors of the revised criterion. As was found to be the case when stability of occupational choice by field was investigated, value measures were associated with stronger effects in predicting stability by level than stability by job title. Of particular note are the tenth grade measures of the four values and the ninth grade measure of Prestige. Level of Occupational Choice (Ninth Grade) was the second most effective predictor of the criterion with total and direct effect of -.13 and -.12 respectively. Vocational Maturity, especially, the tenth grade measure, was also found to have a relatively strong influence upon the criterion. GPA (Tenth Grade) was found to have a total effect of .12 which was equally divided into direct and indirect effects. The most efficient predictor of the criterion was found to be Stability of Expressed Occupational Choice by Level (Ninth to Tenth Grade), having a total effect of .46 and a direct effect of .43. The small effects associated with Sex and Socioeconomic Status are worth noting. The residual was computed to be .87 which indicates that the model accounts for 25 percent of the variability in the criterion, Stability of Expressed Occupational Choice by Level.

SUMMARY AND DISCUSSION

Summary

In view of many of the current trends in education, it would appear that intensive study of the occupational choice processes and ways in which students who have made stable occupational choices can be identified are necessary. While it is true that we as educators do have some know-

Table 11: Effects Upon the Variable Stability of Expressed Occupational Choice by Level (Ninth to Twelfth Grade)

	Variable	Total Effect	Direct Effects	Total Indirect Effect
1.	Interest and Satisfaction[a]	.02	-.03	.05
2.	Salary[a]	.01	.04	-.03
3.	Prestige[a]	-.04	.03	-.07
4.	Security[a]	.02	.02	.00
5.	GATB "G"[a]	.04	-.02	.06
6.	GATB "M"[a]	.07	.09	-.02
7.	Sex	.02	.01	.01
8.	Socioeconomic Status	.01	.03	-.02
9.	Vocational Maturity[a]	.08	-.02	.10
10.	Level of Occupational Choice[a]	-.13	-.12	-.01
11.	GPA[a]	.06	.03	.03
12.	Interest and Satisfaction[b]	.09	.10	-.01
13.	Salary[b]	-.03	.01	-.04
14.	Prestige[b]	-.07	-.03	-.04
15.	Security[b]	.05	.02	.03
16.	Vocational Maturity[b]	.13	.07	.06
17.	Curriculum[b]	-.11	-.06	-.05
18.	GPA[b]	.12	.06	.06
19.	Stability of Expressed Occupational Choice by Level[c]	.46	.43	.03
20.	Level of Expressed Occupational Choice[b]	-.04	.01	-.05
	Residual	.87		

[a]Ninth Grade Data

[b]Tenth Grade Data

[c]Ninth to Tenth Grade Data

ledge about the choice process and what affects it, more is needed. In addition, we need to develop ways to facilitate that process. The problem of identifying students who have made occupational choices that will remain stable is a rather new field. With the call for education to be relevant, accountable, and treat students according to individual needs, further study of this problem would seem to be a top priority need.

The purpose of this study was to develop, examine the validity of, and modify a model for predicting the stability of the expressed occupational choices of secondary school students. An original model utilizing twenty predictor variables was developed and examined by Path Analysis. Based upon the first analysis, a revised model was developed by deleting nine variables from the original model. One further revision in the model and three revisions of the final criterion variable were made in order to examine the strength and validity of the model.

Discussion

The students in today's secondary school are required to make and are making occupational choices. Two questions can be asked about these choices, are they realistic and are they stable. Disregarding the reality of the choices, the 550 students used in this study exhibited the following characteristics:

1. 185 could be classified as stable in their expressed occupation choice by job title from ninth to twelfth grade.
2. 250 could be classified as stable in their expressed occupational choice by job title from tenth to twelfth grade.
3. 306 could be classified as stable in their expressed occupational choice by field (Roe 1956) from ninth to twelfth grade.
4. 340 could be classified as stable in their expressed occupational choice by level (Roe 1956) from ninth to twelfth grade.

The predictors used in the model were those which had been identified by previous studies as being related to the choice of a particular occupation, occupational field, or occupational level. Regardless of whether the final criterion was stability of job title, occupational field, or occupational level the following conclusions hold true with only slight variation in the relative power of the predictors.

The major conclusion of this study is that the stability of the expressed occupational choices of secondary students cannot be predicted to any great extent except by previous stability. At least, such a criterion cannot be predicted using the model composed of the variables utilized in this study. This conclusion was supported by the observation that only a small amount of the variance (nine percent) associated with the criterion was explained by the model when Stability of Expressed Occupational Choice (Ninth to Tenth Grade) was not included as a predictor. Further indication that the stability of the expressed occupational choice was not predictable was obtained when the model was utilized to predict Stability of Expressed Occupational Choice (Tenth to Twelfth Grade). The model, including Stability of Expressed Occupational Choice (Ninth to Tenth Grade) as a predictor, explained only nine percent of the variance in the modified criterion.

The best predictor of Stability of Expressed Occupational Choice (Ninth to Twelfth Grade) is Stability of Expressed Occupational Choice (Ninth to Tenth Grade). Of the 286 students who expressed the same occupational choice at tenth grade as they had expressed at ninth grade, 185 continued to choose that same occupation at twelfth grade. Thus, sixty-five percent, or approximately two out of every three, of the students who were consistent in their occupational choice from ninth to tenth grade were also consistent in their occupational choice from ninth to twelfth

grade. This particular variable, Stability of Expressed Occupational Choice (Ninth to Tenth Grade), explained more of the variance in the criterion than did the remaining variables combined. This was also true when the criterion was broadened to stability of occupational field and level.

Among the many student characteristics which were related to Stability of Expressed Occupational Choice (Ninth to Twelfth Grade), several should be noted. The degree of academic success the student experiences, as measured by GPA, affects the stability of his occupational choice. The successful student more often exhibits stability of occupational choice than his or her academically unsuccessful counterpart. The more vocationally mature student is also slightly more likely to remain stable in terms of occupational choice than the less vocationally mature individual. The student enrolled in the Vocational curriculum is also slightly more likely to continue to express the same occupational choice throughout the secondary school years than the academic student. In fact, in terms of Stability of Expressed Occupational Choice (Tenth to Twelfth Grade), whether or not the student is enrolled in the Vocational curriculum is almost as good a predictor of stability of an occupational choice as is Stability of Expressed Occupational Choice (Ninth to Tenth Grade). On the whole, however, the stability of an occupational choice is not predictable using the above mentioned variables.

It may be that the student's knowledge of himself and knowledge of various occupations are the main factors influencing the stability of his occupational choice. This study did not concern itself with measuring these types of student knowledge. The findings of this study seem to indicate that the stability of an occupational choice is an idiosyncratic occurence during these years. The stability of an occupational choice may be a result of environment, personality, or circumstances. There appears to be no

common denominator among those variables considered by this study which distinguishes between those who will remain stable in terms of their expressed occupational choice and those who will not.

Perhaps among the more important findings of this study was the fact that certain variables are not related to the stability of an occupational choice. No overall sex differences were found. Whether the student is male or female has no effect upon stability of choice. Although sex differences were found in early measures of GPA and in level of occupational choice, these differences decreased in later measures of the same variables.

Socioeconomic status was found to affect achievement and level of occupational choice, but had little affect upon the stability of an occupational choice. That is, students from higher socioeconomic backgrounds tend to have better school achievement records and choose higher level occupations. However, their occupational choices, once expressed, are not significantly more or less stable than are the choices of students from lower socioeconomic backgrounds.

A student's occupational values affect the level of occupation he chooses as well as the curriculum he enters. But, occupational values have a minimal effect upon the stability of an occupational choice. Although the values, Interest and Satisfaction, and Salary, appear to be the most important, the value structure of most students appears to be in a state of flux during this period in life. Values do however tend to have a greater effect upon stability of field and level of occupational choices than upon stability of job title.

The findings of this study tend to support Super's (1960) contention that ninth graders are not psychologically ready to make occupational choices. This may, however, be a result of the present educational system. Thus, McDaniels' (1968) statement that youth are not too young to choose but rather

to poorly informed to choose, may not be in disagreement with Super's contention. Once the world of work and career development become the focus of educational programs, stability of expressed occupational choice may become a viable criterion for determining when students are ready for specific occupational instruction.

Ginzberg, Ginsburg, Axelrad, and Herma (1951) proposed that the tentative choice period occurs between ages eleven and eighteen. The findings of this study seem to support this hypotheses. Especially notable is the Value Stage occurring at age fifteen to sixteen during which students' value hierarchies undergo considerable change. This may explain the minor influence occupational values had upon the stability of occupational choice during the time period covered by this study.

In general, the findings of this study seem to imply that three major deficiencies exist in today's educational system. First, students need more planned activities throughout their educational years which will provide them with opportunities to gain knowledge about occupations and their personal capabilities. This seems to support the implementation of a philosophy such as Career Education or at the very least a strong exploratory program such as Industrial Arts in the middle school years.

Second, provisions must be in the present educational system which will allow ex-students to reenter the educational system and to allow students to change programs. Since many students are not making stable occupational choices during this period, adequate program alternatives must be provided for those changing their occupational choices. Since the occupational choices of students were more often stable if viewed in terms of field or level, more programs based on the cluster or family of occupations concept may be needed at the secondary level.

Lastly, if a program such as Career Education is not implemented or if

no program can be developed which will prepare the majority of students to make stable occupational choices during the beginning of the secondary school years, the current method of evaluating Vocational Education must be viewed as being unrealistic. If students do not make stable occupational choices during high school, they cannot necessarily be expected to enter occupations for which they were trained during that period. Thus, under the existing educational system, it is completely unrealistic to evaluate Vocational Education on the basis of how many students enter occupations for which they were trained during high school.

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OVIS

OHIO VOCATIONAL INTEREST SURVEY

Test Department, Harcourt Brace Jovanovich, Inc.

SPECIAL REPORT SERIES

Report No. 4/November 1974

OVIS TWO-YEAR STABILITY STUDY:
Grade 9 — Grade 11 (Pennsylvania Sample)

This report presents the results of a stability study of the OVIS scales over a two-year period from Grade 9 to Grade 11. The results indicate that the females were more stable than the males in their inventoried interests over the two-year period. The data provide further evidence of scale independence and additional support for the Cubistic Model of Vocational Interests (D'Costa, et al., 1969). This study supplements the Grade 8 to Grade 10 and the Grade 10 to Grade 12 stability data, reported in the first OVIS *Newsletter* (November 1971).

The sample discussed in this report consisted of 307 male and 379 female students from a Pennsylvania school district, tested first in 1971 and again in 1973. The means, standard deviations, and two-year stability coefficients for the males are reported in Table 1. The results of tests of significance for the difference between the correlated means and for the difference between the correlated variances are reported in columns 7 and 8 respectively. Table 2 contains this same information for the female sample. For the convenience of the reader, Table A contains a summary of the stability coefficients from Tables 1 and 2 for comparison with similar data from the previously reported stability study. Table 3 presents a comparison of the two-year test-retest intercorrelations and the stability coefficients by scale and by sex.

The stability coefficients for the Pennsylvania males, shown in Table 1, range from .37 to .62, with a median value of .542. Inspection of the means and standard deviations in this table indicates that they are representative of the total male normative group data presented in the OVIS *Manual for Interpreting*. The *z*-values listed in column 7 indicate that the mean scores for the 24 scales were quite stable over the two-year period, with only four of the OVIS scales (Scales 5, 13, 18, 23) showing significant mean score differences[1]. It should be noted that although these differences are statistically significant, the greatest mean score difference was only 1.1 score points, on Scale 18. The *t*-values reported in column 8 indicate that the variances were also quite stable over the two-year period, with only Scale 7 showing a significant difference. It is interesting to note that although the variances on Scale 7 are significantly different, the corresponding means are not.

As shown in Table 2, the stability coefficients for the females are slightly higher and somewhat less variable than those for the males, ranging from .50 to .70, with a median value of .595. Inspection of the means and standard deviations for this group indicates that they also are generally consistent with those of the normative group. The *z*-values listed in column 7 indicate that the mean scores were highly unstable, with 16 of the 24 OVIS scales showing significant mean score differences over the two-year period. The average mean score difference over these 16 scales was 1.49 score points, with a maximum difference of 3.2 score points on Scale 22. The *t*-values reported in column 8 indicate that the variances for each scale were more stable than the mean values, with only five scales (Scales 1, 6, 7, 15, 20) showing significant difference. Again, note that although the variances on Scales 6 and 20 are significantly different, the corresponding means are not.

[1] All statistical tests reported in this paper were two-tailed tests evaluated at the .05 level of significance.

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An interesting situation is presented by the data in Tables 1 and 2. The group with the higher stability coefficients, in this case the female group, showed the most change in terms of mean scores. The males, on the other hand, had lower stability coefficients, yet as a group their mean scores changed very little. This difference between males and females might suggest the presence of some systematic variable, perhaps socialization, interacting with maturation to influence the interests of the females as a group. Regardless of its source, this variables does not appear to be a factor in the males' interest patterns.

The data from the Pennsylvania female group in Table A below confirm the finding of the stability study cited earlier that inventoried interests stabilize with age. With respect to both the median value and the quartile ranges, the Pennsylvania females were more stable than the younger Texas sample, but less stable than the older Wisconsin group. The data for the Pennsylvania male group did not support this finding. In fact, this group was the least stable of the male groups on both median and quartile range indexes.

Table A. Median and Quartile Stability Values for Texas, Pennsylvania and Wisconsin Samples (Grade Levels in Parenthesis)

	Male			Female		
Quartile Points	Texas (8-10)	Penn. (9-11)	Wisc. (10-12)	Texas (8-10)	Penn. (9-11)	Wisc. (10-12)
Q_1	.538	.510	.550	.480	.545	.565
Q_2 (median)	.558	.542	.580	.520	.595	.665
Q_3	.590	.565	.615	.585	.630	.695
Range	.50-.63	.37-.62	.44-.70	.39-.66	.50-.70	.39-.71

From the data given in Table 4, it can be seen that over a two-year period the OVIS scales still satisfy one of the important criteria for scale independence described in the OVIS *Manual for Interpreting*. With the exception of Scale 3 for the males, the two-year test-retest correlations between any two different scales did not exceed the two-year test-retest stability of either scale. For example, consider Scale 2 for the female group. The two-year test-retest stability coefficient (e.g., 9th Grade scores correlated with 11th Grade scores) was .51. In the next column to the right, headed "Grade 9 vs 11," it can be seen that the 9th Grade scores on Scale 2 correlated second highest with the 11th Grade scores on Scale 1 (r=.46). Note that this correlation is lower than the stability coefficients for either Scale 1 or Scale 2, which were found to be .55 and .51, respectively. The next column to the right, labeled "Grade 11 vs 9," shows that 11th Grade scores on Scale 2 correlated highest with 9th Grade scores on Scale 7 (r= .48). Again, the criterion for independence is met. Furthermore, these two-year test-retest correlations between different OVIS scales are consistent with the Cubistic Model. That is, the scales showing the highest intercorrelations over the two-year period are typically adjacent in the Cubistic Model, indicating a relationship among the characteristics being measured [2].

It should be noted that longitudinal studies of this type are sensitive to changes that take place in the student's vocational development. Super and Crites (1962) proposed that the changes that take place in vocational interests may possibly be related to factors such as course orientation, achievement in a given curriculum, and financial situation. Therefore, over a span of two years, especially in those years of high school during which the student must make realistic vocational plans, it is not surprising to see a shift in the student's

[2] See page 3 in the OVIS *Manual for Interpreting* for a geometric presentation of the Cubistic Model and the relationship between the OVIS scales.

perception of the world of work. Such a shift results in the lowering of a test-retest reliability coefficient, thus explaining the differences between the two-year test-retest reliability values given in Tables 1 and 2, and the two-week test-retest values presented in the OVIS *Manual for Interpreting.*

The data used in this report were compiled by the Department of Vocational Education of The Pennsylvania State University in conjunction with the University's Vocational Development Study, a ten-year longitudinal study of vocational development, made possible by a grant from the Bureau of Vocational, Technical, and Continuing Education, Research Coordinating Unit, Pennsylvania Department of Education. The Test Department would like to thank all concerned for making this data available.

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Table 1. Summary Data from Ovis Two-Year Follow-up Study, Pennsylvania Male Sample (N 307)

OVIS Scale	Grade 9		Grade 11				
	Mean	S.D.	Mean	S.D.	$r_{(9-11)}$	$z_{(9-11)}$	$t_{(9-11)}$
1	23.1	7.74	23.5	7.51	.45	- .88	.59
2	29.2	10.20	30.0	9.48	.56	-1.51	1.54
3	22.2	7.35	21.7	7.12	.37	1.08	.60
4	26.3	8.54	25.7	7.86	.56	1.36	1.75
5	23.2	7.40	22.4	6.93	.51	1.97*	1.33
6	23.7	7.65	24.5	7.79	.43	-1.70	- .35
7	30.6	9.87	30.9	8.97	.54	- .58	1.99*
8	25.5	7.74	24.9	7.67	.53	1.41	.19
9	24.3	8.49	23.8	8.36	.51	1.05	.31
10	22.7	7.33	23.0	7.62	.47	- .67	- .77
11	30.9	7.82	31.2	7.78	.50	- .68	.10
12	24.7	7.64	25.0	8.12	.56	- .71	-1.29
13	27.6	10.20	26.5	9.77	.62	2.21*	.96
14	29.9	8.39	29.8	8.28	.58	.23	.28
15	27.1	9.90	27.9	9.42	.53	-1.50	1.02
16	32.8	9.66	32.2	9.13	.61	1.26	1.24
17	27.6	9.23	27.8	8.80	.61	- .44	1.05
18	27.8	8.68	28.9	8.64	.54	-2.32*	.10
19	27.3	8.50	26.6	8.10	.53	1.52	.99
20	27.3	7.91	27.3	8.07	.55	.00	- .42
21	27.4	10.98	27.2	10.46	.54	.34	1.01
22	24.8	8.41	24.8	8.31	.56	.00	.25
23	28.6	8.63	27.6	8.72	.56	2.15*	- .22
24	25.4	9.53	25.0	9.55	.59	.81	- .05

*Significant at .05 level

Table 2. Summary Data from Ovis Two-Year Follow-up Study, Pennsylvania Female Sample (N=379)

OVIS Scale	Grade 9		Grade 11		r (9-11)	z (9-11)	t (9-11)
	Mean	S.D.	Mean	S.D.			
1	17.6	6.02	18.4	6.88	.55	-2.53*	-3.11*
2	15.8	6.31	16.9	6.80	.51	-3.29*	-1.69
3	27.2	8.49	26.0	8.85	.54	2.81*	- .96
4	40.4	9.80	39.5	9.46	.70	2.35*	.96
5	32.4	10.34	30.9	10.83	.64	3.25*	-1.17
6	21.3	6.87	21.6	7.58	.54	- .84	-2.27*
7	18.0	5.91	19.3	6.94	.52	-3.98*	-3.67*
8	32.7	9.19	33.0	9.65	.55	- .65	-1.14
9	36.7	11.52	36.1	11.57	.69	1.28	- .12
10	30.4	8.88	28.6	9.07	.62	4.48*	- .52
11	32.5	8.07	32.6	8.20	.59	- .26	- 38
12	29.6	9.37	28.5	9.58	.61	2.56*	- .54
13	25.7	10.71	23.7	10.03	.58	4.09*	1.56
14	22.2	7.38	22.7	7.73	.59	-1.42	-1.14
15	20.8	9.14	22.1	9.85	.68	-3.32*	-1.98*
16	20.4	7.65	21.4	8.01	.62	-2.85*	-1.14
17	28.4	8.86	29.2	8.99	.60	-1.95	- .35
18	25.1	7.65	25.9	8.14	.50	-1.97*	-1.39
19	35.1	9.70	33.9	9.87	.61	2.70*	- .43
20	23.2	6.77	23.8	7.54	.50	-1.63	-2.42*
21	31.2	11.69	29.0	11.57	.64	4.34*	.26
22	32.5	10.39	29.3	10.62	.62	6.80*	- .54
23	34.6	9.35	32.0	9.37	.59	5.97*	- .05
24	30.0	11.84	29.4	11.42	.67	1.24	.94

*Significant at .05 level

Table 3. Summary of OVIS Stability Coefficients and Test-Retest Intercorrelations by Scale and Sex Group for Pennsylvania Sample

	Male			Female		
OVIS Scale	r	Grade 9 vs 11	Grade 11 vs 9	r	Grade 9 vs 11	Grade 11 vs 9
1	.45	.41 (2)*	.38 (2)	.55	.49 (6)	.47 (7,15)
2	.56	.46 (7)	.49 (7)	.51	.46 (1)	.48 (7)
3	.37	.40 (8)	.38 (5)	.54	.44 (5,10)	.41 (6)
4	.56	.32 (22)	.38 (9)	.70	.49 (9)	.51 (9)
5	.51	.47 (8)	.38 (8)	.64	.40 (8)	.45 (8)
6	.43	.43 (2)	.35 (1,2)	.54	.44 (1)	.49 (1)
7	.54	.49 (2)	.46 (2)	.52	.48 (2)	.43 (2,15,16)
8	.53	.47 (17,20)	.47 (5)	.55	.45 (5)	.40 (3,5)
9	.51	.48 (24)	.38 (24)	.69	.57 (24)	.58 (24)
10	.47	.41 (23)	.39 (19)	.62	.34 (11)	.44 (3)
11	.50	.38 (7)	.37 (8)	.59	.38 (19,22)	.43 (22)
12	.56	.51 (17)	.47 (17)	.61	.50 (17)	.51 (17)
13	.62	.40 (14)	.39 (5,16)	.58	.37 (18)	.33 (14)
14	.58	.54 (16)	.55 (16)	.59	.54 (16)	.54 (16)
15	.53	.39 (4)	.30 (4)	.68	.47 (1)	.47 (7)
16	.61	.55 (14)	.54 (14)	.62	.53 (14)	.54 (14)
17	.61	.49 (18)	.53 (23)	.60	.45 (18)	.50 (12)
18	.54	.53 (20)	.51 (20)	.50	.43 (17,20)	.48 (20)
19	.53	.42 (12)	.39 (10)	.61	.44 (12)	.42 (12)
20	.55	.51 (18)	.53 (18)	.50	.48 (18)	.43 (18)
21	.54	.44 (22)	.33 (19,22)	.61	.52 (22)	.57 (23)
22	.56	.43 (12)	.47 (12)	.62	.51 (21)	.52 (21)
23	.56	.46 (12,18)	.41 (5,8,10,17)	.59	.57 (21)	.43 (17)
24	.59	.35 (4,12)	.48 (9)	.67	.58 (9)	.57 (9)

*OVIS Scale(s) corresponding to the highest intercorrelation in parenthesis

APPENDIX D

Appendix D contains Tables 1, 2, 3 and 4 representing the number and percentage of responses to each item of the questionnaire for both the Hazleton and Williamsport one-year after graduation follow-up, by curriculum and sex for questionnaire parts A, B, C and D.

Appendix D is much too large to reproduce a number of times, therefore, one copy is supplied to the sponsoring agency, and is on file with, The Director, The Research Coordinating Unit, The Pennsylvania Department of Education, Box 911, Harrisburg, Pennsylvania 17126.